VLT/ERIS

ERIS Template Manual

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Change Record

Version	Date	Section affected	Comment
111.0	25/08/2022	–	Initial release for P111
111.1	14/12/2022	2.1, 2.2, 3.1, 3.2, 4.2, 6.6	Hidden and default state changed for SEQ keywords PRESET, SE, PUPILTRK, DO.PERSIST.ST, NIX.SHUTTER.CLOSE.ST. ERIS_nixAPP_cal_StandardStar removed.
112.0	30/06/2023	2.1, 2.2, 3.2	Added differential tracking and SAM templates.
112.1	13/08/2023	4.1, 4.2, 5, 6	Added ERIS_nixIMG_cal_Astrom, ERIS_ifs_cal_SpecPhot, and several technical templates. Several minor changes to tables and man pages.
113.0	24/11/2023	2.1, 2.2	Added `EXTENDED` and `EXTENDED_FULL` keywords.
114.0	14/04/2023	2.2, 3.2	Modifications throughout to align with latest instrument package.
115.0	24/11/2024	3.2.2	Added `OBSTYPE=F` to `ERIS_nixFPC_obs_GenericOffset` template.

Contents

1 Introduction

This manual contains reference information for all ERIS observation, calibration and maintenance templates. The first part of this document contains a brief description of each template followed by a list of the parameters that can be used to configure the template. The latter part of this document contains the `man` page for each template.

A high-level description of the instrument characteristics and performance is given in the ERIS User Manual (RD1), and details of the instrument calibration plan can be found in the ERIS Calibration Plan (RD2). Both of these documents are available on the ERIS public website[1].

1.1 Applicabe Documents

The following documents, of the exact issue shown, form a part of this document to the extent specified herein. In the event of conflict between the documents referenced herein and the contents of this document, the contents of this document shall be considered as a superseding requirement.

– None –

1.2 Reference Documents

The following reference documents contain useful information relevant to the subject of the present document.

	Document Number	**Document Title**	**Issue**	**Date**
RD1	ESO-476500	ERIS User Manual	111.0	25/08/2022
RD2	ESO-476498	ERIS Calibration Plan	111.0	25/08/2022

[1] `https://www.eso.org/sci/facilities/paranal/instruments/eris/doc.html`

2 ERIS Acquisition Templates

2.1 IFS (SPIFFIER) Templates

2.1.1 ERIS_ifs_acq_LGS

This template acquires a target on SPIFFIER in LGS mode. All subsystems are preset in parallel. After presets are done, except for instrument preset which can proceed in parallel during the acquisition, the guide star is acquired and the active optics loop is run for a few iterations. After this, active optics is turned off andThe NGS and LGS loops are setup and started. After the loops are closed and the instrument preset is completed, the source is interactively centered on the instrument.

ERIS_ifs_acq_LGS.tsf

To be specified:

Parameter	Hidden	Range *(Default)*	Label
DET.DIT	no	0..3600 *(-)*	Integration time (DIT) for interactive centering
DET.NDIT	no	1..100 *(-)*	Number of Integrations (NDIT) for interactive centering
INS.BAND.NAME	no	J_low J_short J_middle J_long H_low H_short H_middle H_long K_low K_short K_middle K_long *(-)*	SPIFFIER grating
INS.SPXW.NAME	no	25mas 100mas 250mas *(-)*	SPIFFIER spaxel size
SEQ.AO.ALTITUDE_TH1	yes	0..90 *(40)*	Limit altitude for LGS full correction
SEQ.AO.ALTITUDE_TH2	yes	0..90 *(45)*	Limit altitude for LGS full correction when trending lower
SEQ.AO.AUTOEXEC	yes	T F *(T)*	OSF auto-exec
SEQ.AO.BIAS_LIMIT_MAG	yes	0..22 *(17.0)*	Limit magnitude for bias subtraction
SEQ.AO.CAMERA_GAIN_FACTOR	yes	1..100 *(4)*	WFS camera gain bootstrap factor
SEQ.AO.CAMERA_GAIN_FACTOR_FAST	yes	1..200 *(10)*	WFS camera gain bootstrap factor fast
SEQ.AO.CAMERA_MAX_GAIN	yes	1..1000 *(400)*	Max allowed WFS camera gain
SEQ.AO.CAMERA_TARGET_VALUE	yes	1..10000 *(2000)*	WFS camera pixel counts target
SEQ.AO.FLUX_ZEROPOINT	yes	0..1e9 *(2.54e7)*	Zero point flux
SEQ.AO.JITTER_KI	yes	0..1 *(-0.30)*	Jitter loop Ki gain
SEQ.AO.JITTER_KP	yes	0..1 *(-0.22)*	Jitter loop Kp gain
SEQ.AO.LGS_CAMERA_GAIN	yes	1..1000 *(100)*	LGS WFS camera gain
SEQ.AO.LIMIT_MAG	yes	0..22 *(16.0)*	Limit magnitude
SEQ.AO.PUPIL_MAX_TIME	yes	0..240 *(120)*	Max allowed time for pupil centering
SEQ.AO.PUPIL_SAMPLES	yes	0..100000 *(1000)*	Samples for pupil centering
SEQ.AO.PUPIL_SKIP	yes	0..100000 *(1000)*	Skip frames for pupil centering
SEQ.AO.PUPIL_THRESHOLD	yes	0..1 *(0.1)*	Threshold for pupil centering
SEQ.AO.SUBAPS_THRESHOLD	yes	0..1 *(0.2)*	Subap illumination threshold
SEQ.AO.TILT_REF	yes	0..1 *(0.0)*	Reference tilt misalignement value
SEQ.AO.TIP_REF	yes	0..1 *(0.0)*	Reference tip misalignment value
SEQ.AO.TN_LOOP	yes	0..100000 *(1000)*	TN loop frames
SEQ.AO.TN_PIXELS	yes	0..10000 *(10)*	TN pixel frames
SEQ.AO.TT_THRESHOLD	yes	0..1 *(0.1)*	Subap tip/tilt misalignement threshold
SEQ.INTERACTIVE_CENTER	no	T F *(T)*	Perform interactive centering
SEQ.LGS.ROUGH.FRAMES	yes	0..10000 *(10)*	LGS ROUGH frames
SEQ.LGS.ROUGH.THRESHOLD	yes	0..10000 *(100.0)*	Threshold for LGS ROUGH spiral search
SEQ.LGS	yes	1..4 *(2)*	Laser ID
SEQ.PRESET	yes	T F *(T)*	Preset Telescope? (T/F)
SEQ.PUPILTRK	yes	T F *(F)*	Pupil tracking mode (T/F)
SEQ.SE	no	T F *(F)*	Perform acquisition in seeing enhancer mode
SEQ.TTS.ALPHA	no	*(000000.0)*	RA of AO TipTilt Star
SEQ.TTS.COLOR	no	-10..10 *(0.0)*	Gaia BP-RP color
SEQ.TTS.DELTA	no	*(000000.0)*	DEC of AO TipTilt Star
SEQ.TTS.MAG	no	-2.0..25.0 *(0.0)*	Gaia RPmag of AO TipTilt Star
SEQ.TTS_EXTENDED	no	T F *(F)*	Extended object (AGN-like)
SEQ.TTS_EXTENDED_FULL	no	T F *(F)*	Extended object (planet-like)
TEL.AG.GUIDESTAR	no	NONE SETUPFILE CATALOGUE *(CATALOGUE)*	Telescope guide star selection
TEL.GS1.ALPHA	no	*(0.)*	RA of telescope guide star
TEL.GS1.DELTA	no	*(0.)*	DEC of telescope guide star
TEL.ROT.OFFANGLE	no	*(0.)*	Position Angle on Sky
TEL.TARG.ADDVELALPHA	yes	-100..100 *(0.0)*	Add Velocity Alpha
TEL.TARG.ADDVELDELTA	yes	-100..100 *(0.0)*	Add Velocity Alpha
TEL.TARG.ALPHA	no	*(0)*	RA
TEL.TARG.DELTA	no	*(0)*	DEC
TEL.TARG.EPOCH	no	-2000..3000 *(2000)*	Epoch
TEL.TARG.EQUINOX	no	-2000..3000 *(2000)*	Equinox
TEL.TARG.PMA	no	-10..10 *(0)*	Proper Motion Alpha
TEL.TARG.PMD	no	-10..10 *(0)*	Proper Motion Delta

Fixed values:

Parameter	Hidden	Value	Label
AOS.AO.MODE	no	Full_AO	AO mode for the template
DPR.CATG	no	ACQUISITION	Data product category
DPR.TECH	no	IFU	Data product technique
DPR.TYPE	no	OBJECT	Data product type
INS.AO.NAME	no	LGS_SKY	AO configuration
INS.AOTRACK.NAME	no	LGS_SKY	AO tracking

INS.CAL.NAME	no	OFF	CU configuration
INS.LAMPS.NAME	no	OFF	Lamps configuration
INS.MODE	no	IFS	ERIS Instrument Mode
SEQ.DO.PERSIST.ST	no	F	record persistence data? (T/F)

2.1.2 ERIS_ifs_acq_LGS_difftrack

This acquisition is the same as ERIS_ifs_acq_LGS, with additional parameters SEQ.TRACK.REF and SEQ.TRACK TARG to specify a non-sidereal motion of the target and/or the AO NGS reference.

ERIS_ifs_acq_LGS_difftrack.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
DET.DIT	no	0..3600 *(-)*	Integration time (DIT) for interactive centering
DET.NDIT	no	1..100 *(-)*	Number of Integrations (NDIT) for interactive centering
INS.BAND.NAME	no	J_low J_short J_middle J_long H_low H_short H_middle H_long K_low K_short K_middle K_long *(-)*	SPIFFIER grating
INS.SPXW.NAME	no	25mas 100mas 250mas *(-)*	SPIFFIER spaxel size
SEQ.AO.ALTITUDE_TH1	yes	0..90 *(40)*	Limit altitude for LGS full correction
SEQ.AO.ALTITUDE_TH2	yes	0..90 *(45)*	Limit altitude for LGS full correction when trending lower
SEQ.AO.AUTOEXEC	yes	T F *(T)*	OSF auto-exec
SEQ.AO.BIAS_LIMIT_MAG	yes	0..22 *(17.0)*	Limit magnitude for bias subtraction
SEQ.AO.CAMERA_GAIN_FACTOR	yes	1..100 *(4)*	WFS camera gain bootstrap factor
SEQ.AO.CAMERA_GAIN_FACTOR_FAST	yes	1..200 *(10)*	WFS camera gain bootstrap factor fast
SEQ.AO.CAMERA_MAX_GAIN	yes	1..1000 *(400)*	Max allowed WFS camera gain
SEQ.AO.CAMERA_TARGET_VALUE	yes	1..10000 *(2000)*	WFS camera pixel counts target
SEQ.AO.FLUX_ZEROPOINT	yes	0..1e9 *(2.54e7)*	Zero point flux
SEQ.AO.JITTER_KI	yes	0..1 *(-0.30)*	Jitter loop Ki gain
SEQ.AO.JITTER_KP	yes	0..1 *(-0.22)*	Jitter loop Kp gain
SEQ.AO.LGS_CAMERA_GAIN	yes	1..1000 *(100)*	LGS WFS camera gain
SEQ.AO.LIMIT_MAG	yes	0..22 *(16.0)*	Limit magnitude
SEQ.AO.PUPIL_MAX_TIME	yes	0..240 *(120)*	Max allowed time for pupil centering
SEQ.AO.PUPIL_SAMPLES	yes	0..100000 *(1000)*	Samples for pupil centering
SEQ.AO.PUPIL_SKIP	yes	0..100000 *(1000)*	Skip frames for pupil centering
SEQ.AO.PUPIL_THRESHOLD	yes	0..1 *(0.1)*	Threshold for pupil centering
SEQ.AO.SUBAPS_THRESHOLD	yes	0..1 *(0.2)*	Subap illumination threshold
SEQ.AO.TILT_REF	yes	0..1 *(0.0)*	Reference tilt misalignement value
SEQ.AO.TIP_REF	yes	0..1 *(0.0)*	Reference tip misalignment value
SEQ.AO.TN_LOOP	yes	0..100000 *(1000)*	TN loop frames
SEQ.AO.TN_PIXELS	yes	0..10000 *(10)*	TN pixel frames
SEQ.AO.TT_THRESHOLD	yes	0..1 *(0.1)*	Subap tip/tilt misalignement threshold
SEQ.INTERACTIVE_CENTER	no	T F *(T)*	Perform interactive centering
SEQ.LGS.ROUGH.FRAMES	yes	0..10000 *(10)*	LGS ROUGH frames
SEQ.LGS.ROUGH.THRESHOLD	yes	0..10000 *(100.0)*	Threshold for LGS ROUGH spiral search
SEQ.LGS	yes	1..4 *(2)*	Laser ID
SEQ.PRESET	yes	T F *(T)*	Preset Telescope? (T/F)
SEQ.SE	no	T F *(F)*	Perform acquisition in seeing enhancer mode
SEQ.TRACK.REF	no	*.track *()*	AO TipTilt tracking table file
SEQ.TRACK.TARG	no	*.track *()*	Target object tracking table file
SEQ.TTS.ALPHA	no	*(000000.0)*	RA of AO TipTilt Star
SEQ.TTS.COLOR	no	-10..10 *(0.0)*	Gaia BP-RP color
SEQ.TTS.DELTA	no	*(000000.0)*	DEC of AO TipTilt Star
SEQ.TTS.MAG	no	-2.0..25.0 *(0.0)*	Gaia RPmag of AO TipTilt Star
SEQ.TTS_EXTENDED	no	T F *(F)*	Extended object (AGN-like)
SEQ.TTS_EXTENDED_FULL	no	T F *(F)*	Extended object (planet-like)
TEL.AG.GUIDESTAR	no	NONE SETUPFILE CATALOGUE *(CATALOGUE)*	Telescope guide star selection
TEL.GS1.ALPHA	no	*(0.)*	RA of telescope guide star
TEL.GS1.DELTA	no	*(0.)*	DEC of telescope guide star
TEL.ROT.OFFANGLE	no	*(0.)*	Position Angle on Sky
TEL.TARG.ADDVELALPHA	yes	-100..100 *(0.0)*	Add Velocity Alpha
TEL.TARG.ADDVELDELTA	yes	-100..100 *(0.0)*	Add Velocity Alpha
TEL.TARG.ALPHA	no	*(0)*	RA
TEL.TARG.DELTA	no	*(0)*	DEC
TEL.TARG.EPOCH	no	-2000..3000 *(2000)*	Epoch
TEL.TARG.EQUINOX	no	-2000..3000 *(2000)*	Equinox
TEL.TARG.PMA	no	-10..10 *(0)*	Proper Motion Alpha
TEL.TARG.PMD	no	-10..10 *(0)*	Proper Motion Delta
Fixed values:			
Parameter	Hidden	Value	Label
AOS.AO.MODE	no	Full_AO	AO mode for the template
DPR.CATG	no	ACQUISITION	Data product category
DPR.TECH	no	IFU	Data product technique
DPR.TYPE	no	OBJECT	Data product type
INS.AO.NAME	no	LGS_SKY	AO configuration
INS.AOTRACK.NAME	no	LGS_SKY	AO tracking
INS.CAL.NAME	no	OFF	CU configuration
INS.LAMPS.NAME	no	OFF	Lamps configuration
INS.MODE	no	IFS	ERIS Instrument Mode

SEQ.DO.PERSIST.ST	no	F	record persistence data? (T/F)
SEQ.PUPILTRK	no	F	Pupil tracking mode (T/F)

2.1.3 ERIS_ifs_acq_NGS

This template acquires a target on SPIFFIER in NGS mode. All subsystems are preset in parallel. After presets are done, except for instrument preset which can proceed in parallel during the acquisition, the guide star is acquired and the active optics loop is run for a few iterations. After this, active optics is turned off and the NGS loop is setup and started. After the loop is closed and the instrument preset is completed, the source is interactively centered on the instrument.

ERIS_ifs_acq_NGS.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
DET.DIT	no	0..3600 *(-)*	Integration time (DIT) for interactive centering
DET.NDIT	no	1..100 *(-)*	Number of Integrations (NDIT) for interactive centering
INS.BAND.NAME	no	J_low J_short J_middle J_long H_low H_short H_middle H_long K_low K_short K_middle K_long *(-)*	SPIFFIER grating
INS.SPXW.NAME	no	25mas 100mas 250mas *(-)*	SPIFFIER spaxel size
SEQ.AO.AUTOEXEC	yes	T F *(T)*	OSF auto-exec
SEQ.AO.BIAS_LIMIT_MAG	yes	0..22 *(17.0)*	Limit magnitude for bias subtraction
SEQ.AO.CAMERA_GAIN_FACTOR	yes	1..100 *(4)*	WFS camera gain bootstrap factor
SEQ.AO.CAMERA_GAIN_FACTOR_FAST	yes	1..200 *(10)*	WFS camera gain bootstrap factor fast
SEQ.AO.CAMERA_MAX_GAIN	yes	1..1000 *(400)*	Max allowed WFS camera gain
SEQ.AO.CAMERA_TARGET_VALUE	yes	1..10000 *(2000)*	WFS camera pixel counts target
SEQ.AO.FLUX_ZEROPOINT	yes	0..1e9 *(2.54e7)*	Zero point flux
SEQ.AO.LIMIT_MAG	yes	0..22 *(16.0)*	Limit magnitude
SEQ.AO.PUPIL_MAX_TIME	yes	0..240 *(120)*	Max allowed time for pupil centering
SEQ.AO.PUPIL_SAMPLES	yes	0..100000 *(1000)*	Samples for pupil centering
SEQ.AO.PUPIL_SKIP	yes	0..100000 *(1000)*	Skip frames for pupil centering
SEQ.AO.PUPIL_THRESHOLD	yes	0..1 *(0.1)*	Threshold for pupil centering
SEQ.AO.SUBAPS_THRESHOLD	yes	0..1 *(0.2)*	Subap illumination threshold
SEQ.AO.TILT_REF	yes	0..1 *(0.0)*	Reference tilt misalignement value
SEQ.AO.TIP_REF	yes	0..1 *(0.0)*	Reference tip misalignment value
SEQ.AO.TN_LOOP	yes	0..100000 *(1000)*	TN loop frames
SEQ.AO.TN_PIXELS	yes	0..10000 *(10)*	TN pixel frames
SEQ.AO.TT_THRESHOLD	yes	0..1 *(0.1)*	Subap tip/tilt misalignement threshold
SEQ.INTERACTIVE_CENTER	no	T F *(T)*	Perform interactive centering
SEQ.NGS.ALPHA	no	*(000000.0)*	RA of AO NGS Star
SEQ.NGS.COLOR	no	-10..10 *(0.0)*	Gaia BP-RP color
SEQ.NGS.DELTA	no	*(000000.0)*	DEC of AO NGS Star
SEQ.NGS.MAG	no	-2.0..25.0 *(0.0)*	Gaia RPmag of AO NGS star
SEQ.NGS_EXTENDED	no	T F *(F)*	Extended object (AGN-like)
SEQ.NGS_EXTENDED_FULL	no	T F *(F)*	Extended object (planet-like)
SEQ.PRESET	yes	T F *(T)*	Preset Telescope? (T/F)
SEQ.PUPILTRK	yes	T F *(F)*	Pupil tracking mode (T/F)
TEL.AG.GUIDESTAR	no	NONE SETUPFILE CATALOGUE *(CATALOGUE)*	Telescope guide star selection
TEL.GS1.ALPHA	no	*(0.)*	RA of telescope guide star
TEL.GS1.DELTA	no	*(0.)*	DEC of telescope guide star
TEL.ROT.OFFANGLE	no	*(0.)*	Position Angle on Sky
TEL.TARG.ADDVELALPHA	yes	-100..100 *(0.0)*	Add Velocity Alpha
TEL.TARG.ADDVELDELTA	yes	-100..100 *(0.0)*	Add Velocity Alpha
TEL.TARG.ALPHA	no	*(0)*	RA
TEL.TARG.DELTA	no	*(0)*	DEC
TEL.TARG.EPOCH	no	-2000..3000 *(2000)*	Epoch
TEL.TARG.EQUINOX	no	-2000..3000 *(2000)*	Equinox
TEL.TARG.PMA	no	-10..10 *(0)*	Proper Motion Alpha
TEL.TARG.PMD	no	-10..10 *(0)*	Proper Motion Delta
Fixed values:			
Parameter	Hidden	Value	Label
AOS.AO.MODE	no	Full_AO	AO mode for the template
DPR.CATG	no	ACQUISITION	Data product category
DPR.TECH	no	IFU	Data product technique
DPR.TYPE	no	OBJECT	Data product type
INS.AO.NAME	no	NGS_SKY	AO configuration
INS.AOTRACK.NAME	no	NGS_SKY	AO tracking
INS.CAL.NAME	no	OFF	CU configuration
INS.LAMPS.NAME	no	OFF	Lamps configuration
INS.MODE	no	IFS	ERIS Instrument Mode
SEQ.DO.PERSIST.ST	no	F	record persistence data? (T/F)

2.1.4 ERIS_ifs_acq_NGS_difftrack

This acquisition is the same as ERIS_ifs_acq_NGS, with additional parameters SEQ.TRACK.REF and SEQ.TRACK TARG to specify a non-sidereal motion of the target and/or the AO NGS reference.

ERIS_ifs_acq_NGS_difftrack.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
DET.DIT	no	0..3600 *(-)*	Integration time (DIT) for interactive centering
DET.NDIT	no	1..100 *(-)*	Number of Integrations (NDIT) for interactive centering
INS.BAND.NAME	no	J_low J_short J_middle J_long H_low H_short H_middle H_long K_low K_short K_middle K_long *(-)*	SPIFFIER grating
INS.SPXW.NAME	no	25mas 100mas 250mas *(-)*	SPIFFIER spaxel size
SEQ.AO.AUTOEXEC	yes	T F *(T)*	OSF auto-exec
SEQ.AO.BIAS_LIMIT_MAG	yes	0..22 *(17.0)*	Limit magnitude for bias subtraction
SEQ.AO.CAMERA_GAIN_FACTOR	yes	1..100 *(4)*	WFS camera gain bootstrap factor
SEQ.AO.CAMERA_GAIN_FACTOR_FAST	yes	1..200 *(10)*	WFS camera gain bootstrap factor fast
SEQ.AO.CAMERA_MAX_GAIN	yes	1..1000 *(400)*	Max allowed WFS camera gain
SEQ.AO.CAMERA_TARGET_VALUE	yes	1..10000 *(2000)*	WFS camera pixel counts target
SEQ.AO.FLUX_ZEROPOINT	yes	0..1e9 *(2.54e7)*	Zero point flux
SEQ.AO.LIMIT_MAG	yes	0..22 *(16.0)*	Limit magnitude
SEQ.AO.PUPIL_MAX_TIME	yes	0..240 *(120)*	Max allowed time for pupil centering
SEQ.AO.PUPIL_SAMPLES	yes	0..100000 *(1000)*	Samples for pupil centering
SEQ.AO.PUPIL_SKIP	yes	0..100000 *(1000)*	Skip frames for pupil centering
SEQ.AO.PUPIL_THRESHOLD	yes	0..1 *(0.1)*	Threshold for pupil centering
SEQ.AO.SUBAPS_THRESHOLD	yes	0..1 *(0.2)*	Subap illumination threshold
SEQ.AO.TILT_REF	yes	0..1 *(0.0)*	Reference tilt misalignement value
SEQ.AO.TIP_REF	yes	0..1 *(0.0)*	Reference tip misalignment value
SEQ.AO.TN_LOOP	yes	0..100000 *(1000)*	TN loop frames
SEQ.AO.TN_PIXELS	yes	0..10000 *(10)*	TN pixel frames
SEQ.AO.TT_THRESHOLD	yes	0..1 *(0.1)*	Subap tip/tilt misalignement threshold
SEQ.INTERACTIVE_CENTER	no	T F *(T)*	Perform interactive centering
SEQ.NGS.ALPHA	no	*(000000.0)*	RA of AO NGS Star
SEQ.NGS.COLOR	no	-10..10 *(0.0)*	Gaia BP-RP color
SEQ.NGS.DELTA	no	*(000000.0)*	DEC of AO NGS Star
SEQ.NGS.MAG	no	-2.0..25.0 *(0.0)*	Gaia RPmag of AO NGS star
SEQ.NGS_EXTENDED	no	T F *(F)*	Extended object (AGN-like)
SEQ.NGS_EXTENDED_FULL	no	T F *(F)*	Extended object (planet-like)
SEQ.PRESET	yes	T F *(T)*	Preset Telescope? (T/F)
SEQ.TRACK.REF	no	*.track *()*	AO NGS tracking table file
SEQ.TRACK.TARG	no	*.track *()*	Target object tracking table file
TEL.AG.GUIDESTAR	no	NONE SETUPFILE CATALOGUE *(CATALOGUE)*	Telescope guide star selection
TEL.GS1.ALPHA	no	*(0.)*	RA of telescope guide star
TEL.GS1.DELTA	no	*(0.)*	DEC of telescope guide star
TEL.ROT.OFFANGLE	no	*(0.)*	Position Angle on Sky
TEL.TARG.ADDVELALPHA	yes	-100..100 *(0.0)*	Add Velocity Alpha
TEL.TARG.ADDVELDELTA	yes	-100..100 *(0.0)*	Add Velocity Alpha
TEL.TARG.ALPHA	no	*(0)*	RA
TEL.TARG.DELTA	no	*(0)*	DEC
TEL.TARG.EPOCH	no	-2000..3000 *(2000)*	Epoch
TEL.TARG.EQUINOX	no	-2000..3000 *(2000)*	Equinox
TEL.TARG.PMA	no	-10..10 *(0)*	Proper Motion Alpha
TEL.TARG.PMD	no	-10..10 *(0)*	Proper Motion Delta
Fixed values:			
Parameter	Hidden	Value	Label
AOS.AO.MODE	no	Full_AO	AO mode for the template
DPR.CATG	no	ACQUISITION	Data product category
DPR.TECH	no	IFU	Data product technique
DPR.TYPE	no	OBJECT	Data product type
INS.AO.NAME	no	NGS_SKY	AO configuration
INS.AOTRACK.NAME	no	NGS_SKY	AO tracking
INS.CAL.NAME	no	OFF	CU configuration
INS.LAMPS.NAME	no	OFF	Lamps configuration
INS.MODE	no	IFS	ERIS Instrument Mode
SEQ.DO.PERSIST.ST	no	F	record persistence data? (T/F)
SEQ.PUPILTRK	no	F	Pupil tracking mode (T/F)

2.1.5 ERIS_ifs_acq_noAO

This template acquires a target on SPIFFIER without using the AO system. Telescope is preset, the guide star acquired and the active optics is started, while in parallel the instrument is being preset. After the previous steps have been completed, the source is interactively centered on the instrument.

ERIS_ifs_acq_noAO.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
DET.DIT	no	0..3600 *(-)*	Integration time (DIT) for interactive centering
DET.NDIT	no	1..100 *(-)*	Number of Integrations (NDIT) for interactive centering
INS.BAND.NAME	no	J_low J_short J_middle J_long H_low H_short H_middle H_long K_low K_short K_middle K_long *(-)*	SPIFFIER grating

INS.SPXW.NAME	no	25mas 100mas 250mas *(-)*	SPIFFIER spaxel size
SEQ.AO.AUTOEXEC	yes	T F *(T)*	OSF auto-exec
SEQ.AO.TN_LOOP	yes	0..100000 *(1000)*	TN loop frames
SEQ.AO.TN_PIXELS	yes	0..10000 *(10)*	TN pixel frames
SEQ.INTERACTIVE_CENTER	no	T F *(T)*	Perform interactive centering
SEQ.PRESET	yes	T F *(T)*	Preset Telescope? (T/F)
SEQ.PUPILTRK	yes	T F *(F)*	Pupil tracking mode (T/F)
TEL.AG.GUIDESTAR	no	NONE SETUPFILE CATALOGUE *(CATALOGUE)*	Telescope guide star selection
TEL.GS1.ALPHA	no	*(0.)*	RA of telescope guide star
TEL.GS1.DELTA	no	*(0.)*	DEC of telescope guide star
TEL.ROT.OFFANGLE	no	*(0.)*	Position Angle on Sky
TEL.TARG.ADDVELALPHA	yes	-100..100 *(0.0)*	Add Velocity Alpha
TEL.TARG.ADDVELDELTA	yes	-100..100 *(0.0)*	Add Velocity Alpha
TEL.TARG.ALPHA	no	*(0)*	RA
TEL.TARG.DELTA	no	*(0)*	DEC
TEL.TARG.EPOCH	no	-2000..3000 *(2000)*	Epoch
TEL.TARG.EQUINOX	no	-2000..3000 *(2000)*	Equinox
TEL.TARG.PMA	no	-10..10 *(0)*	Proper Motion Alpha
TEL.TARG.PMD	no	-10..10 *(0)*	Proper Motion Delta
Fixed values:			
Parameter	Hidden	Value	Label
AOS.AO.MODE	no	NoAO	AO mode for the template
DPR.CATG	no	ACQUISITION	Data product category
DPR.TECH	no	IFU	Data product technique
DPR.TYPE	no	OBJECT	Data product type
INS.MODE	no	IFS	ERIS Instrument Mode
SEQ.DO.PERSIST.ST	no	F	record persistence data? (T/F)

2.2 Imaging (NIX) Templates

2.2.1 ERIS_nixAPP_acq_LGS

This template is very similar to the ERIS_nixIMG_acq_LGS but created specially for the APP coronagraph (pupil plane). The acquisition images are taken without the APP which is placed in the optical path afterwards.

ERIS_nixAPP_acq_LGS.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
DET.DIT	no	0.0..1800.0 *(-)*	Integration time (DIT) for interactive centering
DET.NDIT	no	1..31775 *(-)*	Number of Integrations (NDIT) for interactive centering
DET.READOUT	no	SLOW_GR_UTR FAST_UNCORR *(SLOW_GR_UTR)*	Detector readout mode
INS.NXFW.NAME	no	H2-cont H2-1-0S Br-g K-peak IB-2.42 IB-2.48 Br-a-cont Br-a *(-)*	NIX filter wheel
SEQ.AO.ALTITUDE_TH1	yes	0..90 *(40)*	Limit altitude for LGS full correction
SEQ.AO.ALTITUDE_TH2	yes	0..90 *(45)*	Limit altitude for LGS full correction when trending lower
SEQ.AO.AUTOEXEC	yes	T F *(T)*	OSF auto-exec
SEQ.AO.BIAS_LIMIT_MAG	yes	0..22 *(17.0)*	Limit magnitude for bias subtraction
SEQ.AO.CAMERA_GAIN_FACTOR	yes	1..100 *(4)*	WFS camera gain bootstrap factor
SEQ.AO.CAMERA_GAIN_FACTOR_FAST	yes	1..200 *(10)*	WFS camera gain bootstrap factor fast
SEQ.AO.CAMERA_MAX_GAIN	yes	1..1000 *(400)*	Max allowed WFS camera gain
SEQ.AO.CAMERA_TARGET_VALUE	yes	1..10000 *(2000)*	WFS camera pixel counts target
SEQ.AO.FLUX_ZEROPOINT	yes	0..1e9 *(2.54e7)*	Zero point flux
SEQ.AO.JITTER_KI	yes	0..1 *(-0.30)*	Jitter loop Ki gain
SEQ.AO.JITTER_KP	yes	0..1 *(-0.22)*	Jitter loop Kp gain
SEQ.AO.LGS_CAMERA_GAIN	yes	1..1000 *(100)*	LGS WFS camera gain
SEQ.AO.LIMIT_MAG	yes	0..22 *(16.0)*	Limit magnitude
SEQ.AO.PUPIL_MAX_TIME	yes	0..240 *(120)*	Max allowed time for pupil centering
SEQ.AO.PUPIL_SAMPLES	yes	0..100000 *(1000)*	Samples for pupil centering
SEQ.AO.PUPIL_SKIP	yes	0..100000 *(1000)*	Skip frames for pupil centering
SEQ.AO.PUPIL_THRESHOLD	yes	0..1 *(0.1)*	Threshold for pupil centering
SEQ.AO.SUBAPS_THRESHOLD	yes	0..1 *(0.2)*	Subap illumination threshold
SEQ.AO.TILT_REF	yes	0..1 *(0.0)*	Reference tilt misalignement value
SEQ.AO.TIP_REF	yes	0..1 *(0.0)*	Reference tip misalignment value
SEQ.AO.TN_LOOP	yes	0..100000 *(1000)*	TN loop frames
SEQ.AO.TN_PIXELS	yes	0..10000 *(10)*	TN pixel frames
SEQ.AO.TT_THRESHOLD	yes	0..1 *(0.1)*	Subap tip/tilt misalignement threshold
SEQ.INTERACTIVE_CENTER	no	T F *(T)*	Perform interactive centering
SEQ.LGS.ROUGH.FRAMES	yes	0..10000 *(10)*	LGS ROUGH frames
SEQ.LGS.ROUGH.THRESHOLD	yes	0..10000 *(100.0)*	Threshold for LGS ROUGH spiral search
SEQ.LGS	yes	1..4 *(2)*	Laser ID
SEQ.NIX.DET.WINDOWING	no	window2 window4 windowF *(windowF)*	NIX Detector windowing Name
SEQ.PRESET	yes	T F *(T)*	Preset Telescope? (T/F)
SEQ.SE	yes	T F *(F)*	Perform acquisition in seeing enhancer mode
SEQ.TTS.ALPHA	no	*(000000.0)*	RA of AO TipTilt Star

SEQ.TTS.COLOR	no	-10..10 *(0.0)*	Gaia BP-RP color
SEQ.TTS.DELTA	no	*(000000.0)*	DEC of AO TipTilt Star
SEQ.TTS.MAG	no	-2.0..25.0 *(0.0)*	Gaia RPmag of AO TipTilt Star
SEQ.TTS_EXTENDED	no	T F *(F)*	Extended object (AGN-like)
SEQ.TTS_EXTENDED_FULL	no	T F *(F)*	Extended object (planet-like)
TEL.AG.GUIDESTAR	no	NONE SETUPFILE CATALOGUE *(CATALOGUE)*	Telescope guide star selection
TEL.GS1.ALPHA	no	*(0.)*	RA of telescope guide star
TEL.GS1.DELTA	no	*(0.)*	DEC of telescope guide star
TEL.ROT.OFFANGLE	yes	*(0.)*	Position Angle on Sky
TEL.TARG.ADDVELALPHA	yes	-100..100 *(0.0)*	Add Velocity Alpha
TEL.TARG.ADDVELDELTA	yes	-100..100 *(0.0)*	Add Velocity Alpha
TEL.TARG.ALPHA	no	*(0)*	RA
TEL.TARG.DELTA	no	*(0)*	DEC
TEL.TARG.EPOCH	no	-2000..3000 *(2000)*	Epoch
TEL.TARG.EQUINOX	no	-2000..3000 *(2000)*	Equinox
TEL.TARG.PMA	no	-10..10 *(0)*	Proper Motion Alpha
TEL.TARG.PMD	no	-10..10 *(0)*	Proper Motion Delta
Fixed values:			
Parameter	Hidden	Value	Label
AOS.AO.MODE	no	Full_AO	AO mode for the template
DPR.CATG	no	ACQUISITION	Data product category
DPR.TECH	no	CORONAGRAPHY,APP	Data product technique
DPR.TYPE	no	OBJECT	Data product type
INS.AO.NAME	no	LGS_SKY	AO configuration
INS.AOTRACK.NAME	no	LGS_SKY	AO tracking
INS.CAL.NAME	no	OFF	CU configuration
INS.LAMPS.NAME	no	OFF	Lamps configuration
INS.MODE	no	nixAPP	ERIS Instrument Mode
INS.NXPW.NAME	no	APP	NIX pupil wheel
SEQ.DO.PERSIST.ST	no	F	record persistence data? (T/F)
SEQ.PUPILTRK	no	T	Pupil tracking mode (T/F)

2.2.2 ERIS_nixAPP_acq_NGS

This acquisition is the same as ERIS_nixIMG_acq_NGS, with the insertion of the APP mask after the interactive source centering.

ERIS_nixAPP_acq_NGS.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
DET.DIT	no	0.0..1800.0 *(-)*	Integration time (DIT) for interactive centering
DET.NDIT	no	1..31775 *(-)*	Number of Integrations (NDIT) for interactive centering
DET.READOUT	no	SLOW_GR_UTR FAST_UNCORR *(SLOW_GR_UTR)*	Detector readout mode
INS.NXFW.NAME	no	H2-cont H2-1-0S Br-g K-peak IB-2.42 IB-2.48 Br-a-cont Br-a *(-)*	NIX filter wheel
SEQ.AO.AUTOEXEC	yes	T F *(T)*	OSF auto-exec
SEQ.AO.BIAS_LIMIT_MAG	yes	0..22 *(17.0)*	Limit magnitude for bias subtraction
SEQ.AO.CAMERA_GAIN_FACTOR	yes	1..100 *(4)*	WFS camera gain bootstrap factor
SEQ.AO.CAMERA_GAIN_FACTOR_FAST	yes	1..200 *(10)*	WFS camera gain bootstrap factor fast
SEQ.AO.CAMERA_MAX_GAIN	yes	1..1000 *(400)*	Max allowed WFS camera gain
SEQ.AO.CAMERA_TARGET_VALUE	yes	1..10000 *(2000)*	WFS camera pixel counts target
SEQ.AO.FLUX_ZEROPOINT	yes	0..1e9 *(2.54e7)*	Zero point flux
SEQ.AO.LIMIT_MAG	yes	0..22 *(16.0)*	Limit magnitude
SEQ.AO.PUPIL_MAX_TIME	yes	0..240 *(120)*	Max allowed time for pupil centering
SEQ.AO.PUPIL_SAMPLES	yes	0..100000 *(1000)*	Samples for pupil centering
SEQ.AO.PUPIL_SKIP	yes	0..100000 *(1000)*	Skip frames for pupil centering
SEQ.AO.PUPIL_THRESHOLD	yes	0..1 *(0.1)*	Threshold for pupil centering
SEQ.AO.SUBAPS_THRESHOLD	yes	0..1 *(0.2)*	Subap illumination threshold
SEQ.AO.TILT_REF	yes	0..1 *(0.0)*	Reference tilt misalignement value
SEQ.AO.TIP_REF	yes	0..1 *(0.0)*	Reference tip misalignment value
SEQ.AO.TN_LOOP	yes	0..100000 *(1000)*	TN loop frames
SEQ.AO.TN_PIXELS	yes	0..10000 *(10)*	TN pixel frames
SEQ.AO.TT_THRESHOLD	yes	0..1 *(0.1)*	Subap tip/tilt misalignement threshold
SEQ.INTERACTIVE_CENTER	no	T F *(T)*	Perform interactive centering
SEQ.NGS.ALPHA	no	*(000000.0)*	RA of AO NGS Star
SEQ.NGS.COLOR	no	-10..10 *(0.0)*	Gaia BP-RP color
SEQ.NGS.DELTA	no	*(000000.0)*	DEC of AO NGS Star
SEQ.NGS.MAG	no	-2.0..25.0 *(0.0)*	Gaia RPmag of AO NGS star
SEQ.NGS_EXTENDED	no	T F *(F)*	Extended object (AGN-like)
SEQ.NGS_EXTENDED_FULL	no	T F *(F)*	Extended object (planet-like)
SEQ.NIX.DET.WINDOWING	no	window2 window4 windowF *(windowF)*	NIX Detector windowing Name
SEQ.PRESET	yes	T F *(T)*	Preset Telescope? (T/F)
TEL.AG.GUIDESTAR	no	NONE SETUPFILE CATALOGUE *(CATALOGUE)*	Telescope guide star selection
TEL.GS1.ALPHA	no	*(0.)*	RA of telescope guide star
TEL.GS1.DELTA	no	*(0.)*	DEC of telescope guide star
TEL.ROT.OFFANGLE	yes	*(0.)*	Position Angle on Sky

TEL.TARG.ADDVELALPHA	yes	-100..100 *(0.0)*	Add Velocity Alpha
TEL.TARG.ADDVELDELTA	yes	-100..100 *(0.0)*	Add Velocity Alpha
TEL.TARG.ALPHA	no	*(0)*	RA
TEL.TARG.DELTA	no	*(0)*	DEC
TEL.TARG.EPOCH	no	-2000..3000 *(2000)*	Epoch
TEL.TARG.EQUINOX	no	-2000..3000 *(2000)*	Equinox
TEL.TARG.PMA	no	-10..10 *(0)*	Proper Motion Alpha
TEL.TARG.PMD	no	-10..10 *(0)*	Proper Motion Delta
Fixed values:			
Parameter	Hidden	Value	Label
AOS.AO.MODE	no	Full_AO	AO mode for the template
DPR.CATG	no	ACQUISITION	Data product category
DPR.TECH	no	CORONAGRAPHY,APP	Data product technique
DPR.TYPE	no	OBJECT	Data product type
INS.AO.NAME	no	NGS_SKY	AO configuration
INS.AOTRACK.NAME	no	NGS_SKY	AO tracking
INS.CAL.NAME	no	OFF	CU configuration
INS.LAMPS.NAME	no	OFF	Lamps configuration
INS.MODE	no	nixAPP	ERIS Instrument Mode
INS.NXPW.NAME	no	APP	NIX pupil wheel
SEQ.DO.PERSIST.ST	no	F	record persistence data? (T/F)
SEQ.PUPILTRK	no	T	Pupil tracking mode (T/F)

2.2.3 ERIS_nixFPC_acq_NGS

This acquisition is the same as ERIS_nixIMG_acq_NGS, with the insertion of the FPC mask after the interactive source centering. The rotator mode defaults to pupil tracking rather than field tracking.

ERIS_nixFPC_acq_NGS.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
DET.DIT	no	0.0..1800.0 *(-)*	Integration time (DIT) for interactive centering
DET.NDIT	no	1..31775 *(-)*	Number of Integrations (NDIT) for interactive centering
DET.READOUT	no	SLOW_GR_UTR FAST_UNCORR *(FAST_UNCORR)*	Detector readout mode
INS.NXFW.NAME	no	Short-Lp Lp Mp Br-a-cont Br-a *(-)*	NIX filter wheel
INS.NXPW.NAME	no	Lyot Lyot-ND *(Lyot)*	NIX pupil wheel
SEQ.AO.AUTOEXEC	yes	T F *(T)*	OSF auto-exec
SEQ.AO.BIAS_LIMIT_MAG	yes	0..22 *(17.0)*	Limit magnitude for bias subtraction
SEQ.AO.CAMERA_GAIN_FACTOR	yes	1..100 *(4)*	WFS camera gain bootstrap factor
SEQ.AO.CAMERA_GAIN_FACTOR_FAST	yes	1..200 *(10)*	WFS camera gain bootstrap factor fast
SEQ.AO.CAMERA_MAX_GAIN	yes	1..1000 *(400)*	Max allowed WFS camera gain
SEQ.AO.CAMERA_TARGET_VALUE	yes	1..10000 *(2000)*	WFS camera pixel counts target
SEQ.AO.FLUX_ZEROPOINT	yes	0..1e9 *(2.54e7)*	Zero point flux
SEQ.AO.LIMIT_MAG	yes	0..22 *(16.0)*	Limit magnitude
SEQ.AO.PUPIL_MAX_TIME	yes	0..240 *(120)*	Max allowed time for pupil centering
SEQ.AO.PUPIL_SAMPLES	yes	0..100000 *(1000)*	Samples for pupil centering
SEQ.AO.PUPIL_SKIP	yes	0..100000 *(1000)*	Skip frames for pupil centering
SEQ.AO.PUPIL_THRESHOLD	yes	0..1 *(0.1)*	Threshold for pupil centering
SEQ.AO.SUBAPS_THRESHOLD	yes	0..1 *(0.2)*	Subap illumination threshold
SEQ.AO.TILT_REF	yes	0..1 *(0.0)*	Reference tilt misalignement value
SEQ.AO.TIP_REF	yes	0..1 *(0.0)*	Reference tip misalignment value
SEQ.AO.TN_LOOP	yes	0..100000 *(1000)*	TN loop frames
SEQ.AO.TN_PIXELS	yes	0..10000 *(10)*	TN pixel frames
SEQ.AO.TT_THRESHOLD	yes	0..1 *(0.1)*	Subap tip/tilt misalignement threshold
SEQ.INTERACTIVE_CENTER	no	T F *(T)*	Perform interactive centering
SEQ.NGS.ALPHA	no	*(000000.0)*	RA of AO NGS Star
SEQ.NGS.COLOR	no	-10..10 *(0.0)*	Gaia BP-RP color
SEQ.NGS.DELTA	no	*(000000.0)*	DEC of AO NGS Star
SEQ.NGS.MAG	no	-2.0..25.0 *(0.0)*	Gaia RPmag of AO NGS star
SEQ.NGS_EXTENDED	no	T F *(F)*	Extended object (AGN-like)
SEQ.NGS_EXTENDED_FULL	no	T F *(F)*	Extended object (planet-like)
SEQ.NIX.DET.WINDOWING	no	window1 window3 *(window1)*	NIX Detector windowing Name
SEQ.OPTBGND.ST	yes	T F *(T)*	Acquire OPT background?
SEQ.OPTIMIZE.DIT	no	0.0..1800.0 *(0.98)*	DIT for OPT image
SEQ.OPTIMIZE.NDIT	no	1..31775 *(1)*	Number of DIT frames
SEQ.OPTIMIZE.NITER	yes	1..10 *(7)*	Number of iterations
SEQ.OPTIMIZE.NSUBDIT	yes	1..20 *(5)*	Number of sub-DITs
SEQ.OPTIMIZE.ST	yes	T F *(T)*	Optimize target position?
SEQ.OPTIMIZE.THRESHOLD	yes	0.05..1 *(0.4)*	Threshold for optimization
SEQ.PRESET	yes	T F *(T)*	Preset Telescope? (T/F)
SEQ.PSF.DIT	no	0.0..1800.0 *(-)*	DIT for PSF image
SEQ.PSF.NDIT	no	1..31775 *(-)*	Number of DIT frames
SEQ.PSFBGND.ST	yes	T F *(T)*	Acquire PSF background?
SEQ.QACITS.ST	yes	T F *(T)*	Perform de-centring correction
SEQ.QACITS_ONLY.ST	yes	T F *(F)*	Skips Opening and NGS acquisition
TEL.AG.GUIDESTAR	no	NONE SETUPFILE CATALOGUE *(CATALOGUE)*	Telescope guide star selection
TEL.GS1.ALPHA	no	*(0.)*	RA of telescope guide star
TEL.GS1.DELTA	no	*(0.)*	DEC of telescope guide star

TEL.ROT.OFFANGLE	yes	*(0.)*	Position Angle on Sky
TEL.SKY.OFFSETALPHA	no	-800..800 *(0.0)*	Alpha offset to sky
TEL.SKY.OFFSETDELTA	no	-800..800 *(30.0)*	Delta offset to sky
TEL.TARG.ADDVELALPHA	yes	-100..100 *(0.0)*	Add Velocity Alpha
TEL.TARG.ADDVELDELTA	yes	-100..100 *(0.0)*	Add Velocity Alpha
TEL.TARG.ALPHA	no	*(0)*	RA
TEL.TARG.DELTA	no	*(0)*	DEC
TEL.TARG.EPOCH	no	-2000..3000 *(2000)*	Epoch
TEL.TARG.EQUINOX	no	-2000..3000 *(2000)*	Equinox
TEL.TARG.PMA	no	-10..10 *(0)*	Proper Motion Alpha
TEL.TARG.PMD	no	-10..10 *(0)*	Proper Motion Delta
Fixed values:			
Parameter	Hidden	Value	Label
AOS.AO.MODE	no	Full_AO	AO mode for the template
DPR.CATG	no	ACQUISITION	Data product category
DPR.TECH	no	IMAGE	Data product technique
DPR.TYPE	no	OBJECT	Data product type
INS.AO.NAME	no	NGS_SKY	AO configuration
INS.AOTRACK.NAME	no	NGS_SKY	AO tracking
INS.CAL.NAME	no	OFF	CU configuration
INS.LAMPS.NAME	no	OFF	Lamps configuration
INS.MODE	no	nixFPC	ERIS Instrument Mode
INS.NXCW.NAME	no	13mas-LM	NIX camera wheel
SEQ.DO.PERSIST.ST	yes	F	record persistence data? (T/F)
SEQ.INTERACTIVE	yes	T	Interactive
SEQ.PUPILTRK	no	T	Pupil tracking mode (T/F)
SEQ.VORTEX.DIT	no	-1	DIT for VORTEX image
SEQ.VORTEX.NDIT	no	-1	Number of VORTEX DIT frames

2.2.4 ERIS_nixIMG_acq_LGS

This template acquires a target on NIX in LGS mode. All subsystems are preset in parallel. After presets are done, except for instrument preset which can proceed in parallel during the acquisition, the guide star is acquired and the active optics loop is run for a few iterations. After this, active optics is turned off andThe NGS and LGS loops are setup and started. After the loops are closed and the instrument preset is completed, the source is interactively centered on the instrument.

ERIS_nixIMG_acq_LGS.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
DET.DIT	no	0.0..1800.0 *(-)*	Integration time (DIT) for interactive centering
DET.NDIT	no	1..31775 *(-)*	Number of Integrations (NDIT) for interactive centering
DET.READOUT	no	SLOW_GR_UTR FAST_UNCORR *(SLOW_GR_UTR)*	Detector readout mode
INS.NXCW.NAME	no	13mas-JHK 27mas-JHK 13mas-LM *(13mas-LM)*	NIX camera wheel
INS.NXFW.NAME	no	J H Ks Pa-b Fe-II H2-cont H2-1-0S Br-g K-peak IB-2.42 IB-2.48 Short-Lp Lp Mp Br-a-cont Br-a *(-)*	NIX filter wheel
INS.NXPW.NAME	no	JHK-pupil Blocking LM-pupil Spider ND *(LM-pupil)*	NIX pupil wheel
SEQ.AO.ALTITUDE_TH1	yes	0..90 *(40)*	Limit altitude for LGS full correction
SEQ.AO.ALTITUDE_TH2	yes	0..90 *(45)*	Limit altitude for LGS full correction when trending lower
SEQ.AO.AUTOEXEC	yes	T F *(T)*	OSF auto-exec
SEQ.AO.BIAS_LIMIT_MAG	yes	0..22 *(17.0)*	Limit magnitude for bias subtraction
SEQ.AO.CAMERA_GAIN_FACTOR	yes	1..100 *(4)*	WFS camera gain bootstrap factor
SEQ.AO.CAMERA_GAIN_FACTOR_FAST	yes	1..200 *(10)*	WFS camera gain bootstrap factor fast
SEQ.AO.CAMERA_MAX_GAIN	yes	1..1000 *(400)*	Max allowed WFS camera gain
SEQ.AO.CAMERA_TARGET_VALUE	yes	1..10000 *(2000)*	WFS camera pixel counts target
SEQ.AO.FLUX_ZEROPOINT	yes	0..1e9 *(2.54e7)*	Zero point flux
SEQ.AO.JITTER_KI	yes	0..1 *(-0.30)*	Jitter loop Ki gain
SEQ.AO.JITTER_KP	yes	0..1 *(-0.22)*	Jitter loop Kp gain
SEQ.AO.LGS_CAMERA_GAIN	yes	1..1000 *(100)*	LGS WFS camera gain
SEQ.AO.LIMIT_MAG	yes	0..22 *(16.0)*	Limit magnitude
SEQ.AO.PUPIL_MAX_TIME	yes	0..240 *(120)*	Max allowed time for pupil centering
SEQ.AO.PUPIL_SAMPLES	yes	0..100000 *(1000)*	Samples for pupil centering
SEQ.AO.PUPIL_SKIP	yes	0..100000 *(1000)*	Skip frames for pupil centering
SEQ.AO.PUPIL_THRESHOLD	yes	0..1 *(0.1)*	Threshold for pupil centering
SEQ.AO.SUBAPS_THRESHOLD	yes	0..1 *(0.2)*	Subap illumination threshold
SEQ.AO.TILT_REF	yes	0..1 *(0.0)*	Reference tilt misalignement value
SEQ.AO.TIP_REF	yes	0..1 *(0.0)*	Reference tip misalignment value
SEQ.AO.TN_LOOP	yes	0..100000 *(1000)*	TN loop frames
SEQ.AO.TN_PIXELS	yes	0..10000 *(10)*	TN pixel frames
SEQ.AO.TT_THRESHOLD	yes	0..1 *(0.1)*	Subap tip/tilt misalignement threshold
SEQ.INTERACTIVE_CENTER	no	T F *(T)*	Perform interactive centering
SEQ.LGS.ROUGH.FRAMES	yes	0..10000 *(10)*	LGS ROUGH frames
SEQ.LGS.ROUGH.THRESHOLD	yes	0..10000 *(100.0)*	Threshold for LGS ROUGH spiral search
SEQ.LGS	yes	1..4 *(2)*	Laser ID

SEQ.NIX.DET.WINDOWING	no	window2 window4 window5 windowF *(windowF)*	NIX Detector windowing Name
SEQ.PRESET	yes	T F *(T)*	Preset Telescope? (T/F)
SEQ.SE	no	T F *(F)*	Perform acquisition in seeing enhancer mode
SEQ.TTS.ALPHA	no	*(000000.0)*	RA of AO TipTilt Star
SEQ.TTS.COLOR	no	-10..10 *(0.0)*	Gaia BP-RP color
SEQ.TTS.DELTA	no	*(000000.0)*	DEC of AO TipTilt Star
SEQ.TTS.MAG	no	-2.0..25.0 *(0.0)*	Gaia RPmag of AO TipTilt Star
SEQ.TTS_EXTENDED	no	T F *(F)*	Extended object (AGN-like)
SEQ.TTS_EXTENDED_FULL	no	T F *(F)*	Extended object (planet-like)
TEL.AG.GUIDESTAR	no	NONE SETUPFILE CATALOGUE *(CATALOGUE)*	Telescope guide star selection
TEL.GS1.ALPHA	no	*(0.)*	RA of telescope guide star
TEL.GS1.DELTA	no	*(0.)*	DEC of telescope guide star
TEL.ROT.OFFANGLE	no	*(0.)*	Position Angle on Sky
TEL.TARG.ADDVELALPHA	yes	-100..100 *(0.0)*	Add Velocity Alpha
TEL.TARG.ADDVELDELTA	yes	-100..100 *(0.0)*	Add Velocity Alpha
TEL.TARG.ALPHA	no	*(0)*	RA
TEL.TARG.DELTA	no	*(0)*	DEC
TEL.TARG.EPOCH	no	-2000..3000 *(2000)*	Epoch
TEL.TARG.EQUINOX	no	-2000..3000 *(2000)*	Equinox
TEL.TARG.PMA	no	-10..10 *(0)*	Proper Motion Alpha
TEL.TARG.PMD	no	-10..10 *(0)*	Proper Motion Delta

Fixed values:

Parameter	Hidden	Value	Label
AOS.AO.MODE	no	Full_AO	AO mode for the template
DPR.CATG	no	ACQUISITION	Data product category
DPR.TECH	no	IMAGE	Data product technique
DPR.TYPE	no	OBJECT	Data product type
INS.AO.NAME	no	LGS_SKY	AO configuration
INS.AOTRACK.NAME	no	LGS_SKY	AO tracking
INS.CAL.NAME	no	OFF	CU configuration
INS.LAMPS.NAME	no	OFF	Lamps configuration
INS.MODE	no	nixIMG	ERIS Instrument Mode
SEQ.DO.PERSIST.ST	no	F	record persistence data? (T/F)
SEQ.PUPILTRK	no	F	Pupil tracking mode (T/F)

2.2.5 ERIS_nixIMG_acq_LGS_difftrack

This acquisition is the same as ERIS_nixIMG_acq_LGS, with additional parameters SEQ.TRACK.REF and SEQ.TRACK TARG to specify a non-sidereal motion of the target and/or the AO NGS reference.

ERIS_nixIMG_acq_LGS_difftrack.tsf

To be specified:

Parameter	Hidden	Range *(Default)*	Label
DET.DIT	no	0.0..1800.0 *(-)*	Integration time (DIT) for interactive centering
DET.NDIT	no	1..31775 *(-)*	Number of Integrations (NDIT) for interactive centering
DET.READOUT	no	SLOW_GR_UTR FAST_UNCORR *(SLOW_GR_UTR)*	Detector readout mode
INS.NXCW.NAME	no	13mas-JHK 27mas-JHK 13mas-LM *(13mas-LM)*	NIX camera wheel
INS.NXFW.NAME	no	J H Ks Pa-b Fe-II H2-cont H2-1-0S Br-g K-peak IB-2.42 IB-2.48 Short-Lp Lp Mp Br-a-cont Br-a *(-)*	NIX filter wheel
INS.NXPW.NAME	no	JHK-pupil Blocking LM-pupil Spider ND *(LM-pupil)*	NIX pupil wheel
SEQ.AO.ALTITUDE_TH1	yes	0..90 *(40)*	Limit altitude for LGS full correction
SEQ.AO.ALTITUDE_TH2	yes	0..90 *(45)*	Limit altitude for LGS full correction when trending lower
SEQ.AO.AUTOEXEC	yes	T F *(T)*	OSF auto-exec
SEQ.AO.BIAS_LIMIT_MAG	yes	0..22 *(17.0)*	Limit magnitude for bias subtraction
SEQ.AO.CAMERA_GAIN_FACTOR	yes	1..100 *(4)*	WFS camera gain bootstrap factor
SEQ.AO.CAMERA_GAIN_FACTOR_FAST	yes	1..200 *(10)*	WFS camera gain bootstrap factor fast
SEQ.AO.CAMERA_MAX_GAIN	yes	1..1000 *(400)*	Max allowed WFS camera gain
SEQ.AO.CAMERA_TARGET_VALUE	yes	1..10000 *(2000)*	WFS camera pixel counts target
SEQ.AO.FLUX_ZEROPOINT	yes	0..1e9 *(2.54e7)*	Zero point flux
SEQ.AO.JITTER_KI	yes	0..1 *(-0.30)*	Jitter loop Ki gain
SEQ.AO.JITTER_KP	yes	0..1 *(-0.22)*	Jitter loop Kp gain
SEQ.AO.LGS_CAMERA_GAIN	yes	1..1000 *(100)*	LGS WFS camera gain
SEQ.AO.LIMIT_MAG	yes	0..22 *(16.0)*	Limit magnitude
SEQ.AO.PUPIL_MAX_TIME	yes	0..240 *(120)*	Max allowed time for pupil centering
SEQ.AO.PUPIL_SAMPLES	yes	0..100000 *(1000)*	Samples for pupil centering
SEQ.AO.PUPIL_SKIP	yes	0..100000 *(1000)*	Skip frames for pupil centering
SEQ.AO.PUPIL_THRESHOLD	yes	0..1 *(0.1)*	Threshold for pupil centering
SEQ.AO.SUBAPS_THRESHOLD	yes	0..1 *(0.2)*	Subap illumination threshold
SEQ.AO.TILT_REF	yes	0..1 *(0.0)*	Reference tilt misalignement value
SEQ.AO.TIP_REF	yes	0..1 *(0.0)*	Reference tip misalignment value
SEQ.AO.TN_LOOP	yes	0..100000 *(1000)*	TN loop frames
SEQ.AO.TN_PIXELS	yes	0..10000 *(10)*	TN pixel frames
SEQ.AO.TT_THRESHOLD	yes	0..1 *(0.1)*	Subap tip/tilt misalignement threshold

SEQ.INTERACTIVE_CENTER	no	T F *(T)*	Perform interactive centering
SEQ.LGS.ROUGH.FRAMES	yes	0..10000 *(10)*	LGS ROUGH frames
SEQ.LGS.ROUGH.THRESHOLD	yes	0..10000 *(100.0)*	Threshold for LGS ROUGH spiral search
SEQ.LGS	yes	1..4 *(2)*	Laser ID
SEQ.NIX.DET.WINDOWING	no	window2 window4 window5 windowF *(windowF)*	NIX Detector windowing Name
SEQ.PRESET	yes	T F *(T)*	Preset Telescope? (T/F)
SEQ.SE	no	T F *(F)*	Perform acquisition in seeing enhancer mode
SEQ.TRACK.REF	no	*.track *()*	AO TipTilt tracking table file
SEQ.TRACK.TARG	no	*.track *()*	Target object tracking table file
SEQ.TTS.ALPHA	no	*(000000.0)*	RA of AO TipTilt Star
SEQ.TTS.COLOR	no	-10..10 *(0.0)*	Gaia BP-RP color
SEQ.TTS.DELTA	no	*(000000.0)*	DEC of AO TipTilt Star
SEQ.TTS.MAG	no	-2.0..25.0 *(0.0)*	Gaia RPmag of AO TipTilt Star
SEQ.TTS_EXTENDED	no	T F *(F)*	Extended object (AGN-like)
SEQ.TTS_EXTENDED_FULL	no	T F *(F)*	Extended object (planet-like)
TEL.AG.GUIDESTAR	no	NONE SETUPFILE CATALOGUE *(CATALOGUE)*	Telescope guide star selection
TEL.GS1.ALPHA	no	*(0.)*	RA of telescope guide star
TEL.GS1.DELTA	no	*(0.)*	DEC of telescope guide star
TEL.ROT.OFFANGLE	no	*(0.)*	Position Angle on Sky
TEL.TARG.ADDVELALPHA	yes	-100..100 *(0.0)*	Add Velocity Alpha
TEL.TARG.ADDVELDELTA	yes	-100..100 *(0.0)*	Add Velocity Alpha
TEL.TARG.ALPHA	no	*(0)*	RA
TEL.TARG.DELTA	no	*(0)*	DEC
TEL.TARG.EPOCH	no	-2000..3000 *(2000)*	Epoch
TEL.TARG.EQUINOX	no	-2000..3000 *(2000)*	Equinox
TEL.TARG.PMA	no	-10..10 *(0)*	Proper Motion Alpha
TEL.TARG.PMD	no	-10..10 *(0)*	Proper Motion Delta

Fixed values:

Parameter	Hidden	Value	Label
AOS.AO.MODE	no	Full_AO	AO mode for the template
DPR.CATG	no	ACQUISITION	Data product category
DPR.TECH	no	IMAGE	Data product technique
DPR.TYPE	no	OBJECT	Data product type
INS.AO.NAME	no	LGS_SKY	AO configuration
INS.AOTRACK.NAME	no	LGS_SKY	AO tracking
INS.CAL.NAME	no	OFF	CU configuration
INS.LAMPS.NAME	no	OFF	Lamps configuration
INS.MODE	no	nixIMG	ERIS Instrument Mode
SEQ.DO.PERSIST.ST	no	F	record persistence data? (T/F)
SEQ.PUPILTRK	no	F	Pupil tracking mode (T/F)

2.2.6 ERIS_nixIMG_acq_NGS

This template acquires a target on NIX in NGS mode. All subsystems are preset in parallel. After presets are done, except for instrument preset which can proceed in parallel during the acquisition, the guide star is acquired and the active optics loop is run for a few iterations. After this, active optics is turned off and the NGS loop is setup and started. After the loop is closed and the instrument preset is completed, the source is interactively centered on the instrument.

ERIS_nixIMG_acq_NGS.tsf

To be specified:

Parameter	Hidden	Range *(Default)*	Label
DET.DIT	no	0.0..1800.0 *(-)*	Integration time (DIT) for interactive centering
DET.NDIT	no	1..31775 *(-)*	Number of Integrations (NDIT) for interactive centering
DET.READOUT	no	SLOW_GR_UTR FAST_UNCORR *(SLOW_GR_UTR)*	Detector readout mode
INS.NXCW.NAME	no	13mas-JHK 27mas-JHK 13mas-LM *(13mas-LM)*	NIX camera wheel
INS.NXFW.NAME	no	J H Ks Pa-b Fe-II H2-cont H2-1-0S Br-g K-peak IB-2.42 IB-2.48 Short-Lp Lp Mp Br-a-cont Br-a *(-)*	NIX filter wheel
INS.NXPW.NAME	no	JHK-pupil Blocking LM-pupil Spider ND *(LM-pupil)*	NIX pupil wheel
SEQ.AO.AUTOEXEC	yes	T F *(T)*	OSF auto-exec
SEQ.AO.BIAS_LIMIT_MAG	yes	0..22 *(17.0)*	Limit magnitude for bias subtraction
SEQ.AO.CAMERA_GAIN_FACTOR	yes	1..100 *(4)*	WFS camera gain bootstrap factor
SEQ.AO.CAMERA_GAIN_FACTOR_FAST	yes	1..200 *(10)*	WFS camera gain bootstrap factor fast
SEQ.AO.CAMERA_MAX_GAIN	yes	1..1000 *(400)*	Max allowed WFS camera gain
SEQ.AO.CAMERA_TARGET_VALUE	yes	1..10000 *(2000)*	WFS camera pixel counts target
SEQ.AO.FLUX_ZEROPOINT	yes	0..1e9 *(2.54e7)*	Zero point flux
SEQ.AO.LIMIT_MAG	yes	0..22 *(16.0)*	Limit magnitude
SEQ.AO.PUPIL_MAX_TIME	yes	0..240 *(120)*	Max allowed time for pupil centering
SEQ.AO.PUPIL_SAMPLES	yes	0..100000 *(1000)*	Samples for pupil centering
SEQ.AO.PUPIL_SKIP	yes	0..100000 *(1000)*	Skip frames for pupil centering
SEQ.AO.PUPIL_THRESHOLD	yes	0..1 *(0.1)*	Threshold for pupil centering
SEQ.AO.SUBAPS_THRESHOLD	yes	0..1 *(0.2)*	Subap illumination threshold
SEQ.AO.TILT_REF	yes	0..1 *(0.0)*	Reference tilt misalignement value

SEQ.AO.TIP_REF	yes	0..1 *(0.0)*	Reference tip misalignment value
SEQ.AO.TN_LOOP	yes	0..100000 *(1000)*	TN loop frames
SEQ.AO.TN_PIXELS	yes	0..10000 *(10)*	TN pixel frames
SEQ.AO.TT_THRESHOLD	yes	0..1 *(0.1)*	Subap tip/tilt misalignement threshold
SEQ.INTERACTIVE_CENTER	no	T F *(T)*	Perform interactive centering
SEQ.NGS.ALPHA	no	*(000000.0)*	RA of AO NGS Star
SEQ.NGS.COLOR	no	-10..10 *(0.0)*	Gaia BP-RP color
SEQ.NGS.DELTA	no	*(000000.0)*	DEC of AO NGS Star
SEQ.NGS.MAG	no	-2.0..25.0 *(0.0)*	Gaia RPmag of AO NGS star
SEQ.NGS_EXTENDED	no	T F *(F)*	Extended object (AGN-like)
SEQ.NGS_EXTENDED_FULL	no	T F *(F)*	Extended object (planet-like)
SEQ.NIX.DET.WINDOWING	no	window2 window4 window5 windowF *(windowF)*	NIX Detector windowing Name
SEQ.PRESET	yes	T F *(T)*	Preset Telescope? (T/F)
SEQ.PUPILTRK	yes	T F *(F)*	Pupil tracking mode (T/F)
TEL.AG.GUIDESTAR	no	NONE SETUPFILE CATALOGUE *(CATALOGUE)*	Telescope guide star selection
TEL.GS1.ALPHA	no	*(0.)*	RA of telescope guide star
TEL.GS1.DELTA	no	*(0.)*	DEC of telescope guide star
TEL.ROT.OFFANGLE	no	*(0.)*	Position Angle on Sky
TEL.TARG.ADDVELALPHA	yes	-100..100 *(0.0)*	Add Velocity Alpha
TEL.TARG.ADDVELDELTA	yes	-100..100 *(0.0)*	Add Velocity Alpha
TEL.TARG.ALPHA	no	*(0)*	RA
TEL.TARG.DELTA	no	*(0)*	DEC
TEL.TARG.EPOCH	no	-2000..3000 *(2000)*	Epoch
TEL.TARG.EQUINOX	no	-2000..3000 *(2000)*	Equinox
TEL.TARG.PMA	no	-10..10 *(0)*	Proper Motion Alpha
TEL.TARG.PMD	no	-10..10 *(0)*	Proper Motion Delta
Fixed values:			
Parameter	Hidden	Value	Label
AOS.AO.MODE	no	Full_AO	AO mode for the template
DPR.CATG	no	ACQUISITION	Data product category
DPR.TECH	no	IMAGE	Data product technique
DPR.TYPE	no	OBJECT	Data product type
INS.AO.NAME	no	NGS_SKY	AO configuration
INS.AOTRACK.NAME	no	NGS_SKY	AO tracking
INS.CAL.NAME	no	OFF	CU configuration
INS.LAMPS.NAME	no	OFF	Lamps configuration
INS.MODE	no	nixIMG	ERIS Instrument Mode
SEQ.DO.PERSIST.ST	no	F	record persistence data? (T/F)

2.2.7 ERIS_nixIMG_acq_NGS_difftrack

This acquisition is the same as ERIS_nixIMG_acq_NGS, with additional parameters SEQ.TRACK.REF and SEQ.TRACK TARG to specify a non-sidereal motion of the target and/or the AO NGS reference.

ERIS_nixIMG_acq_NGS_difftrack.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
DET.DIT	no	0.0..1800.0 *(-)*	Integration time (DIT) for interactive centering
DET.NDIT	no	1..31775 *(-)*	Number of Integrations (NDIT) for interactive centering
DET.READOUT	no	SLOW_GR_UTR FAST_UNCORR *(SLOW_GR_UTR)*	Detector readout mode
INS.NXCW.NAME	no	13mas-JHK 27mas-JHK 13mas-LM *(13mas-LM)*	NIX camera wheel
INS.NXFW.NAME	no	J H Ks Pa-b Fe-II H2-cont H2-1-0S Br-g K-peak IB-2.42 IB-2.48 Short-Lp Lp Mp Br-a-cont Br-a *(-)*	NIX filter wheel
INS.NXPW.NAME	no	JHK-pupil Blocking LM-pupil Spider ND *(LM-pupil)*	NIX pupil wheel
SEQ.AO.AUTOEXEC	yes	T F *(T)*	OSF auto-exec
SEQ.AO.BIAS_LIMIT_MAG	yes	0..22 *(17.0)*	Limit magnitude for bias subtraction
SEQ.AO.CAMERA_GAIN_FACTOR	yes	1..100 *(4)*	WFS camera gain bootstrap factor
SEQ.AO.CAMERA_GAIN_FACTOR_FAST	yes	1..200 *(10)*	WFS camera gain bootstrap factor fast
SEQ.AO.CAMERA_MAX_GAIN	yes	1..1000 *(400)*	Max allowed WFS camera gain
SEQ.AO.CAMERA_TARGET_VALUE	yes	1..10000 *(2000)*	WFS camera pixel counts target
SEQ.AO.FLUX_ZEROPOINT	yes	0..1e9 *(2.54e7)*	Zero point flux
SEQ.AO.LIMIT_MAG	yes	0..22 *(16.0)*	Limit magnitude
SEQ.AO.PUPIL_MAX_TIME	yes	0..240 *(120)*	Max allowed time for pupil centering
SEQ.AO.PUPIL_SAMPLES	yes	0..100000 *(1000)*	Samples for pupil centering
SEQ.AO.PUPIL_SKIP	yes	0..100000 *(1000)*	Skip frames for pupil centering
SEQ.AO.PUPIL_THRESHOLD	yes	0..1 *(0.1)*	Threshold for pupil centering
SEQ.AO.SUBAPS_THRESHOLD	yes	0..1 *(0.2)*	Subap illumination threshold
SEQ.AO.TILT_REF	yes	0..1 *(0.0)*	Reference tilt misalignement value
SEQ.AO.TIP_REF	yes	0..1 *(0.0)*	Reference tip misalignment value
SEQ.AO.TN_LOOP	yes	0..100000 *(1000)*	TN loop frames
SEQ.AO.TN_PIXELS	yes	0..10000 *(10)*	TN pixel frames
SEQ.AO.TT_THRESHOLD	yes	0..1 *(0.1)*	Subap tip/tilt misalignement threshold
SEQ.INTERACTIVE_CENTER	no	T F *(T)*	Perform interactive centering
SEQ.NGS.ALPHA	no	*(000000.0)*	RA of AO NGS Star

SEQ.NGS.COLOR	no	-10..10 *(0.0)*	Gaia BP-RP color
SEQ.NGS.DELTA	no	*(000000.0)*	DEC of AO NGS Star
SEQ.NGS.MAG	no	-2.0..25.0 *(0.0)*	Gaia RPmag of AO NGS star
SEQ.NGS_EXTENDED	no	T F *(F)*	Extended object (AGN-like)
SEQ.NGS_EXTENDED_FULL	no	T F *(F)*	Extended object (planet-like)
SEQ.NIX.DET.WINDOWING	no	window2 window4 window5 windowF *(windowF)*	NIX Detector windowing Name
SEQ.PRESET	yes	T F *(T)*	Preset Telescope? (T/F)
SEQ.TRACK.REF	no	*.track *()*	AO NGS tracking table file
SEQ.TRACK.TARG	no	*.track *()*	Target object tracking table file
TEL.AG.GUIDESTAR	no	NONE SETUPFILE CATALOGUE *(CATALOGUE)*	Telescope guide star selection
TEL.GS1.ALPHA	no	*(0.)*	RA of telescope guide star
TEL.GS1.DELTA	no	*(0.)*	DEC of telescope guide star
TEL.ROT.OFFANGLE	no	*(0.)*	Position Angle on Sky
TEL.TARG.ADDVELALPHA	yes	-100..100 *(0.0)*	Add Velocity Alpha
TEL.TARG.ADDVELDELTA	yes	-100..100 *(0.0)*	Add Velocity Alpha
TEL.TARG.ALPHA	no	*(0)*	RA
TEL.TARG.DELTA	no	*(0)*	DEC
TEL.TARG.EPOCH	no	-2000..3000 *(2000)*	Epoch
TEL.TARG.EQUINOX	no	-2000..3000 *(2000)*	Equinox
TEL.TARG.PMA	no	-10..10 *(0)*	Proper Motion Alpha
TEL.TARG.PMD	no	-10..10 *(0)*	Proper Motion Delta
Fixed values:			
Parameter	Hidden	Value	Label
AOS.AO.MODE	no	Full_AO	AO mode for the template
DPR.CATG	no	ACQUISITION	Data product category
DPR.TECH	no	IMAGE	Data product technique
DPR.TYPE	no	OBJECT	Data product type
INS.AO.NAME	no	NGS_SKY	AO configuration
INS.AOTRACK.NAME	no	NGS_SKY	AO tracking
INS.CAL.NAME	no	OFF	CU configuration
INS.LAMPS.NAME	no	OFF	Lamps configuration
INS.MODE	no	nixIMG	ERIS Instrument Mode
SEQ.DO.PERSIST.ST	no	F	record persistence data? (T/F)
SEQ.PUPILTRK	no	F	Pupil tracking mode (T/F)

2.2.8 ERIS_nixIMG_acq_noAO

This template acquires a target on NIX without using the AO system. Telescope is preset, the guide star acquired and the active optics is started, while in parallel the instrument is being preset. After the previous steps have been completed, the source is interactively centered on the instrument.

ERIS_nixIMG_acq_noAO.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
DET.DIT	no	0.0..1800.0 *(-)*	Integration time (DIT) for interactive centering
DET.NDIT	no	1..31775 *(-)*	Number of Integrations (NDIT) for interactive centering
DET.READOUT	no	SLOW_GR_UTR FAST_UNCORR *(SLOW_GR_UTR)*	Detector readout mode
INS.NXCW.NAME	no	13mas-JHK 27mas-JHK 13mas-LM *(13mas-LM)*	NIX camera wheel
INS.NXFW.NAME	no	J H Ks Pa-b Fe-II H2-cont H2-1-0S Br-g K-peak IB-2.42 IB-2.48 Short-Lp Lp Mp Br-a-cont Br-a *(-)*	NIX filter wheel
INS.NXPW.NAME	no	JHK-pupil Blocking LM-pupil Spider ND *(LM-pupil)*	NIX pupil wheel
SEQ.AO.AUTOEXEC	yes	T F *(T)*	OSF auto-exec
SEQ.AO.TN_LOOP	yes	0..100000 *(1000)*	TN loop frames
SEQ.AO.TN_PIXELS	yes	0..10000 *(10)*	TN pixel frames
SEQ.INTERACTIVE_CENTER	no	T F *(T)*	Perform interactive centering
SEQ.NIX.DET.WINDOWING	no	window2 window4 window5 windowF *(windowF)*	NIX Detector windowing Name
SEQ.PRESET	yes	T F *(T)*	Preset Telescope? (T/F)
SEQ.PUPILTRK	yes	T F *(F)*	Pupil tracking mode (T/F)
TEL.AG.GUIDESTAR	no	NONE SETUPFILE CATALOGUE *(CATALOGUE)*	Telescope guide star selection
TEL.GS1.ALPHA	no	*(0.)*	RA of telescope guide star
TEL.GS1.DELTA	no	*(0.)*	DEC of telescope guide star
TEL.ROT.OFFANGLE	no	*(0.)*	Position Angle on Sky
TEL.TARG.ADDVELALPHA	yes	-100..100 *(0.0)*	Add Velocity Alpha
TEL.TARG.ADDVELDELTA	yes	-100..100 *(0.0)*	Add Velocity Alpha
TEL.TARG.ALPHA	no	*(0)*	RA
TEL.TARG.DELTA	no	*(0)*	DEC
TEL.TARG.EPOCH	no	-2000..3000 *(2000)*	Epoch
TEL.TARG.EQUINOX	no	-2000..3000 *(2000)*	Equinox
TEL.TARG.PMA	no	-10..10 *(0)*	Proper Motion Alpha
TEL.TARG.PMD	no	-10..10 *(0)*	Proper Motion Delta
Fixed values:			
Parameter	Hidden	Value	Label

AOS.AO.MODE	no	NoAO	AO mode for the template
DPR.CATG	no	ACQUISITION	Data product category
DPR.TECH	no	IMAGE	Data product technique
DPR.TYPE	no	OBJECT	Data product type
INS.MODE	no	nixIMG	ERIS Instrument Mode
SEQ.DO.PERSIST.ST	no	F	record persistence data? (T/F)

2.2.9 ERIS_nixLSS_acq_LGS

This acquisition is the same as ERIS_nixIMG_acq_LGS. Following interactive source centering, the LSS mask is inserted.

ERIS_nixLSS_acq_LGS.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
DET.DIT	no	0.0..1800.0 *(-)*	Integration time (DIT) for interactive centering
DET.NDIT	no	1..31775 *(-)*	Number of Integrations (NDIT) for interactive centering
DET.READOUT	no	SLOW_GR_UTR FAST_UNCORR *(SLOW_GR_UTR)*	Detector readout mode
SEQ.AO.ALTITUDE_TH1	yes	0..90 *(40)*	Limit altitude for LGS full correction
SEQ.AO.ALTITUDE_TH2	yes	0..90 *(45)*	Limit altitude for LGS full correction when trending lower
SEQ.AO.AUTOEXEC	yes	T F *(T)*	OSF auto-exec
SEQ.AO.BIAS_LIMIT_MAG	yes	0..22 *(17.0)*	Limit magnitude for bias subtraction
SEQ.AO.CAMERA_GAIN_FACTOR	yes	1..100 *(4)*	WFS camera gain bootstrap factor
SEQ.AO.CAMERA_GAIN_FACTOR_FAST	yes	1..200 *(10)*	WFS camera gain bootstrap factor fast
SEQ.AO.CAMERA_MAX_GAIN	yes	1..1000 *(400)*	Max allowed WFS camera gain
SEQ.AO.CAMERA_TARGET_VALUE	yes	1..10000 *(2000)*	WFS camera pixel counts target
SEQ.AO.FLUX_ZEROPOINT	yes	0..1e9 *(2.54e7)*	Zero point flux
SEQ.AO.JITTER_KI	yes	0..1 *(-0.30)*	Jitter loop Ki gain
SEQ.AO.JITTER_KP	yes	0..1 *(-0.22)*	Jitter loop Kp gain
SEQ.AO.LGS_CAMERA_GAIN	yes	1..1000 *(100)*	LGS WFS camera gain
SEQ.AO.LIMIT_MAG	yes	0..22 *(16.0)*	Limit magnitude
SEQ.AO.PUPIL_MAX_TIME	yes	0..240 *(120)*	Max allowed time for pupil centering
SEQ.AO.PUPIL_SAMPLES	yes	0..100000 *(1000)*	Samples for pupil centering
SEQ.AO.PUPIL_SKIP	yes	0..100000 *(1000)*	Skip frames for pupil centering
SEQ.AO.PUPIL_THRESHOLD	yes	0..1 *(0.1)*	Threshold for pupil centering
SEQ.AO.SUBAPS_THRESHOLD	yes	0..1 *(0.2)*	Subap illumination threshold
SEQ.AO.TILT_REF	yes	0..1 *(0.0)*	Reference tilt misalignement value
SEQ.AO.TIP_REF	yes	0..1 *(0.0)*	Reference tip misalignment value
SEQ.AO.TN_LOOP	yes	0..100000 *(1000)*	TN loop frames
SEQ.AO.TN_PIXELS	yes	0..10000 *(10)*	TN pixel frames
SEQ.AO.TT_THRESHOLD	yes	0..1 *(0.1)*	Subap tip/tilt misalignement threshold
SEQ.INTERACTIVE_CENTER	no	T F *(T)*	Perform interactive centering
SEQ.LGS.ROUGH.FRAMES	yes	0..10000 *(10)*	LGS ROUGH frames
SEQ.LGS.ROUGH.THRESHOLD	yes	0..10000 *(100.0)*	Threshold for LGS ROUGH spiral search
SEQ.LGS	yes	1..4 *(2)*	Laser ID
SEQ.PRESET	yes	T F *(T)*	Preset Telescope? (T/F)
SEQ.SE	no	T F *(F)*	Perform acquisition in seeing enhancer mode
SEQ.TTS.ALPHA	no	*(000000.0)*	RA of AO TipTilt Star
SEQ.TTS.COLOR	no	-10..10 *(0.0)*	Gaia BP-RP color
SEQ.TTS.DELTA	no	*(000000.0)*	DEC of AO TipTilt Star
SEQ.TTS.MAG	no	-2.0..25.0 *(0.0)*	Gaia RPmag of AO TipTilt Star
SEQ.TTS_EXTENDED	no	T F *(F)*	Extended object (AGN-like)
SEQ.TTS_EXTENDED_FULL	no	T F *(F)*	Extended object (planet-like)
TEL.AG.GUIDESTAR	no	NONE SETUPFILE CATALOGUE *(CATALOGUE)*	Telescope guide star selection
TEL.GS1.ALPHA	no	*(0.)*	RA of telescope guide star
TEL.GS1.DELTA	no	*(0.)*	DEC of telescope guide star
TEL.ROT.OFFANGLE	no	*(0.)*	Position Angle on Sky
TEL.TARG.ADDVELALPHA	yes	-100..100 *(0.0)*	Add Velocity Alpha
TEL.TARG.ADDVELDELTA	yes	-100..100 *(0.0)*	Add Velocity Alpha
TEL.TARG.ALPHA	no	*(0)*	RA
TEL.TARG.DELTA	no	*(0)*	DEC
TEL.TARG.EPOCH	no	-2000..3000 *(2000)*	Epoch
TEL.TARG.EQUINOX	no	-2000..3000 *(2000)*	Equinox
TEL.TARG.PMA	no	-10..10 *(0)*	Proper Motion Alpha
TEL.TARG.PMD	no	-10..10 *(0)*	Proper Motion Delta
Fixed values:			
Parameter	Hidden	Value	Label
AOS.AO.MODE	no	Full_AO	AO mode for the template
DPR.CATG	no	ACQUISITION	Data product category
DPR.TECH	no	IMAGE	Data product technique
DPR.TYPE	no	OBJECT	Data product type
INS.AO.NAME	no	LGS_SKY	AO configuration
INS.AOTRACK.NAME	no	LGS_SKY	AO tracking
INS.CAL.NAME	no	OFF	CU configuration
INS.LAMPS.NAME	no	OFF	Lamps configuration
INS.MODE	no	nixLSS	ERIS Instrument Mode
INS.NXCW.NAME	no	13mas-LSS	NIX camera wheel
INS.NXFW.NAME	no	L-Broad	NIX filter wheel

INS.NXPW.NAME	no	Grism	NIX pupil wheel
SEQ.DO.PERSIST.ST	no	F	record persistence data? (T/F)
SEQ.NIX.DET.WINDOWING	no	windowF	NIX Detector windowing Name
SEQ.PUPILTRK	no	F	Pupil tracking mode (T/F)

2.2.10 ERIS_nixLSS_acq_LGS_difftrack

This acquisition is the same as ERIS_nixIMG_acq_LGS. Following interactive source centering, the LSS mask is inserted. Two additional parameters SEQ.TRACK.REF and SEQ.TRACK TARG allow to specify a non-sidereal motion of the target and/or the AO NGS reference.

ERIS_nixLSS_acq_LGS_difftrack.tsf

To be specified:

Parameter	Hidden	Range *(Default)*	Label
DET.DIT	no	0.0..1800.0 *(-)*	Integration time (DIT) for interactive centering
DET.NDIT	no	1..31775 *(-)*	Number of Integrations (NDIT) for interactive centering
DET.READOUT	no	SLOW_GR_UTR FAST_UNCORR *(SLOW_GR_UTR)*	Detector readout mode
SEQ.AO.ALTITUDE_TH1	yes	0..90 *(40)*	Limit altitude for LGS full correction
SEQ.AO.ALTITUDE_TH2	yes	0..90 *(45)*	Limit altitude for LGS full correction when trending lower
SEQ.AO.AUTOEXEC	yes	T F *(T)*	OSF auto-exec
SEQ.AO.BIAS_LIMIT_MAG	yes	0..22 *(17.0)*	Limit magnitude for bias subtraction
SEQ.AO.CAMERA_GAIN_FACTOR	yes	1..100 *(4)*	WFS camera gain bootstrap factor
SEQ.AO.CAMERA_GAIN_FACTOR_FAST	yes	1..200 *(10)*	WFS camera gain bootstrap factor fast
SEQ.AO.CAMERA_MAX_GAIN	yes	1..1000 *(400)*	Max allowed WFS camera gain
SEQ.AO.CAMERA_TARGET_VALUE	yes	1..10000 *(2000)*	WFS camera pixel counts target
SEQ.AO.FLUX_ZEROPOINT	yes	0..1e9 *(2.54e7)*	Zero point flux
SEQ.AO.JITTER_KI	yes	0..1 *(-0.30)*	Jitter loop Ki gain
SEQ.AO.JITTER_KP	yes	0..1 *(-0.22)*	Jitter loop Kp gain
SEQ.AO.LGS_CAMERA_GAIN	yes	1..1000 *(100)*	LGS WFS camera gain
SEQ.AO.LIMIT_MAG	yes	0..22 *(16.0)*	Limit magnitude
SEQ.AO.PUPIL_MAX_TIME	yes	0..240 *(120)*	Max allowed time for pupil centering
SEQ.AO.PUPIL_SAMPLES	yes	0..100000 *(1000)*	Samples for pupil centering
SEQ.AO.PUPIL_SKIP	yes	0..100000 *(1000)*	Skip frames for pupil centering
SEQ.AO.PUPIL_THRESHOLD	yes	0..1 *(0.1)*	Threshold for pupil centering
SEQ.AO.SUBAPS_THRESHOLD	yes	0..1 *(0.2)*	Subap illumination threshold
SEQ.AO.TILT_REF	yes	0..1 *(0.0)*	Reference tilt misalignement value
SEQ.AO.TIP_REF	yes	0..1 *(0.0)*	Reference tip misalignment value
SEQ.AO.TN_LOOP	yes	0..100000 *(1000)*	TN loop frames
SEQ.AO.TN_PIXELS	yes	0..10000 *(10)*	TN pixel frames
SEQ.AO.TT_THRESHOLD	yes	0..1 *(0.1)*	Subap tip/tilt misalignement threshold
SEQ.INTERACTIVE_CENTER	no	T F *(T)*	Perform interactive centering
SEQ.LGS.ROUGH.FRAMES	yes	0..10000 *(10)*	LGS ROUGH frames
SEQ.LGS.ROUGH.THRESHOLD	yes	0..10000 *(100.0)*	Threshold for LGS ROUGH spiral search
SEQ.LGS	yes	1..4 *(2)*	Laser ID
SEQ.PRESET	yes	T F *(T)*	Preset Telescope? (T/F)
SEQ.SE	no	T F *(F)*	Perform acquisition in seeing enhancer mode
SEQ.TRACK.REF	no	*.track *()*	AO TipTilt tracking table file
SEQ.TRACK.TARG	no	*.track *()*	Target object tracking table file
SEQ.TTS.ALPHA	no	*(000000.0)*	RA of AO TipTilt Star
SEQ.TTS.COLOR	no	-10..10 *(0.0)*	Gaia BP-RP color
SEQ.TTS.DELTA	no	*(000000.0)*	DEC of AO TipTilt Star
SEQ.TTS.MAG	no	-2.0..25.0 *(0.0)*	Gaia RPmag of AO TipTilt Star
SEQ.TTS_EXTENDED	no	T F *(F)*	Extended object (AGN-like)
SEQ.TTS_EXTENDED_FULL	no	T F *(F)*	Extended object (planet-like)
TEL.AG.GUIDESTAR	no	NONE SETUPFILE CATALOGUE *(CATALOGUE)*	Telescope guide star selection
TEL.GS1.ALPHA	no	*(0.)*	RA of telescope guide star
TEL.GS1.DELTA	no	*(0.)*	DEC of telescope guide star
TEL.ROT.OFFANGLE	no	*(0.)*	Position Angle on Sky
TEL.TARG.ADDVELALPHA	yes	-100..100 *(0.0)*	Add Velocity Alpha
TEL.TARG.ADDVELDELTA	yes	-100..100 *(0.0)*	Add Velocity Alpha
TEL.TARG.ALPHA	no	*(0)*	RA
TEL.TARG.DELTA	no	*(0)*	DEC
TEL.TARG.EPOCH	no	-2000..3000 *(2000)*	Epoch
TEL.TARG.EQUINOX	no	-2000..3000 *(2000)*	Equinox
TEL.TARG.PMA	no	-10..10 *(0)*	Proper Motion Alpha
TEL.TARG.PMD	no	-10..10 *(0)*	Proper Motion Delta

Fixed values:

Parameter	Hidden	Value	Label
AOS.AO.MODE	no	Full_AO	AO mode for the template
DPR.CATG	no	ACQUISITION	Data product category
DPR.TECH	no	IMAGE	Data product technique
DPR.TYPE	no	OBJECT	Data product type
INS.AO.NAME	no	LGS_SKY	AO configuration
INS.AOTRACK.NAME	no	LGS_SKY	AO tracking
INS.CAL.NAME	no	OFF	CU configuration
INS.LAMPS.NAME	no	OFF	Lamps configuration
INS.MODE	no	nixLSS	ERIS Instrument Mode

INS.NXCW.NAME	no	13mas-LSS	NIX camera wheel
INS.NXFW.NAME	no	L-Broad	NIX filter wheel
INS.NXPW.NAME	no	Grism	NIX pupil wheel
SEQ.DO.PERSIST.ST	no	F	record persistence data? (T/F)
SEQ.NIX.DET.WINDOWING	no	windowF	NIX Detector windowing Name
SEQ.PUPILTRK	no	F	Pupil tracking mode (T/F)

2.2.11 ERIS_nixLSS_acq_NGS

This acquisition is the same as ERIS_nixIMG_acq_NGS, with the insertion of the LSS mask after the interactive source centering.

ERIS_nixLSS_acq_NGS.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
DET.DIT	no	0.0..1800.0 *(-)*	Integration time (DIT) for interactive centering
DET.NDIT	no	1..31775 *(-)*	Number of Integrations (NDIT) for interactive centering
DET.READOUT	no	SLOW_GR_UTR FAST_UNCORR *(SLOW_GR_UTR)*	Detector readout mode
SEQ.AO.AUTOEXEC	yes	T F *(T)*	OSF auto-exec
SEQ.AO.BIAS_LIMIT_MAG	yes	0..22 *(17.0)*	Limit magnitude for bias subtraction
SEQ.AO.CAMERA_GAIN_FACTOR	yes	1..100 *(4)*	WFS camera gain bootstrap factor
SEQ.AO.CAMERA_GAIN_FACTOR_FAST	yes	1..200 *(10)*	WFS camera gain bootstrap factor fast
SEQ.AO.CAMERA_MAX_GAIN	yes	1..1000 *(400)*	Max allowed WFS camera gain
SEQ.AO.CAMERA_TARGET_VALUE	yes	1..10000 *(2000)*	WFS camera pixel counts target
SEQ.AO.FLUX_ZEROPOINT	yes	0..1e9 *(2.54e7)*	Zero point flux
SEQ.AO.LIMIT_MAG	yes	0..22 *(16.0)*	Limit magnitude
SEQ.AO.PUPIL_MAX_TIME	yes	0..240 *(120)*	Max allowed time for pupil centering
SEQ.AO.PUPIL_SAMPLES	yes	0..100000 *(1000)*	Samples for pupil centering
SEQ.AO.PUPIL_SKIP	yes	0..100000 *(1000)*	Skip frames for pupil centering
SEQ.AO.PUPIL_THRESHOLD	yes	0..1 *(0.1)*	Threshold for pupil centering
SEQ.AO.SUBAPS_THRESHOLD	yes	0..1 *(0.2)*	Subap illumination threshold
SEQ.AO.TILT_REF	yes	0..1 *(0.0)*	Reference tilt misalignement value
SEQ.AO.TIP_REF	yes	0..1 *(0.0)*	Reference tip misalignment value
SEQ.AO.TN_LOOP	yes	0..100000 *(1000)*	TN loop frames
SEQ.AO.TN_PIXELS	yes	0..10000 *(10)*	TN pixel frames
SEQ.AO.TT_THRESHOLD	yes	0..1 *(0.1)*	Subap tip/tilt misalignement threshold
SEQ.INTERACTIVE_CENTER	no	T F *(T)*	Perform interactive centering
SEQ.NGS.ALPHA	no	*(000000.0)*	RA of AO NGS Star
SEQ.NGS.COLOR	no	-10..10 *(0.0)*	Gaia BP-RP color
SEQ.NGS.DELTA	no	*(000000.0)*	DEC of AO NGS Star
SEQ.NGS.MAG	no	-2.0..25.0 *(0.0)*	Gaia RPmag of AO NGS star
SEQ.NGS_EXTENDED	no	T F *(F)*	Extended object (AGN-like)
SEQ.NGS_EXTENDED_FULL	no	T F *(F)*	Extended object (planet-like)
SEQ.PRESET	yes	T F *(T)*	Preset Telescope? (T/F)
TEL.AG.GUIDESTAR	no	NONE SETUPFILE CATALOGUE *(CATALOGUE)*	Telescope guide star selection
TEL.GS1.ALPHA	no	*(0.)*	RA of telescope guide star
TEL.GS1.DELTA	no	*(0.)*	DEC of telescope guide star
TEL.ROT.OFFANGLE	no	*(0.)*	Position Angle on Sky
TEL.TARG.ADDVELALPHA	yes	-100..100 *(0.0)*	Add Velocity Alpha
TEL.TARG.ADDVELDELTA	yes	-100..100 *(0.0)*	Add Velocity Alpha
TEL.TARG.ALPHA	no	*(0)*	RA
TEL.TARG.DELTA	no	*(0)*	DEC
TEL.TARG.EPOCH	no	-2000..3000 *(2000)*	Epoch
TEL.TARG.EQUINOX	no	-2000..3000 *(2000)*	Equinox
TEL.TARG.PMA	no	-10..10 *(0)*	Proper Motion Alpha
TEL.TARG.PMD	no	-10..10 *(0)*	Proper Motion Delta
Fixed values:			
Parameter	Hidden	Value	Label
AOS.AO.MODE	no	Full_AO	AO mode for the template
DPR.CATG	no	ACQUISITION	Data product category
DPR.TECH	no	IMAGE	Data product technique
DPR.TYPE	no	OBJECT	Data product type
INS.AO.NAME	no	NGS_SKY	AO configuration
INS.AOTRACK.NAME	no	NGS_SKY	AO tracking
INS.CAL.NAME	no	OFF	CU configuration
INS.LAMPS.NAME	no	OFF	Lamps configuration
INS.MODE	no	nixLSS	ERIS Instrument Mode
INS.NXCW.NAME	no	13mas-LSS	NIX camera wheel
INS.NXFW.NAME	no	L-Broad	NIX filter wheel
INS.NXPW.NAME	no	Grism	NIX pupil wheel
SEQ.DO.PERSIST.ST	no	F	record persistence data? (T/F)
SEQ.NIX.DET.WINDOWING	no	windowF	NIX Detector windowing Name
SEQ.PUPILTRK	no	F	Pupil tracking mode (T/F)

2.2.12 ERIS_nixLSS_acq_NGS_difftrack

This acquisition is the same as ERIS_nixIMG_acq_NGS, with additional parameters SEQ.TRACK.REF and SEQ.TRACK TARG to specify a non-sidereal motion of the target and/or the AO NGS reference. Following interactive source centering, the LSS mask is inserted.

ERIS_nixLSS_acq_NGS_difftrack.tsf

To be specified:

Parameter	Hidden	Range *(Default)*	Label
DET.DIT	no	0.0..1800.0 *(-)*	Integration time (DIT) for interactive centering
DET.NDIT	no	1..31775 *(-)*	Number of Integrations (NDIT) for interactive centering
DET.READOUT	no	SLOW_GR_UTR FAST_UNCORR *(SLOW_GR_UTR)*	Detector readout mode
SEQ.AO.AUTOEXEC	yes	T F *(T)*	OSF auto-exec
SEQ.AO.BIAS_LIMIT_MAG	yes	0..22 *(17.0)*	Limit magnitude for bias subtraction
SEQ.AO.CAMERA_GAIN_FACTOR	yes	1..100 *(4)*	WFS camera gain bootstrap factor
SEQ.AO.CAMERA_GAIN_FACTOR_FAST	yes	1..200 *(10)*	WFS camera gain bootstrap factor fast
SEQ.AO.CAMERA_MAX_GAIN	yes	1..1000 *(400)*	Max allowed WFS camera gain
SEQ.AO.CAMERA_TARGET_VALUE	yes	1..10000 *(2000)*	WFS camera pixel counts target
SEQ.AO.FLUX_ZEROPOINT	yes	0..1e9 *(2.54e7)*	Zero point flux
SEQ.AO.LIMIT_MAG	yes	0..22 *(16.0)*	Limit magnitude
SEQ.AO.PUPIL_MAX_TIME	yes	0..240 *(120)*	Max allowed time for pupil centering
SEQ.AO.PUPIL_SAMPLES	yes	0..100000 *(1000)*	Samples for pupil centering
SEQ.AO.PUPIL_SKIP	yes	0..100000 *(1000)*	Skip frames for pupil centering
SEQ.AO.PUPIL_THRESHOLD	yes	0..1 *(0.1)*	Threshold for pupil centering
SEQ.AO.SUBAPS_THRESHOLD	yes	0..1 *(0.2)*	Subap illumination threshold
SEQ.AO.TILT_REF	yes	0..1 *(0.0)*	Reference tilt misalignement value
SEQ.AO.TIP_REF	yes	0..1 *(0.0)*	Reference tip misalignment value
SEQ.AO.TN_LOOP	yes	0..100000 *(1000)*	TN loop frames
SEQ.AO.TN_PIXELS	yes	0..10000 *(10)*	TN pixel frames
SEQ.AO.TT_THRESHOLD	yes	0..1 *(0.1)*	Subap tip/tilt misalignement threshold
SEQ.INTERACTIVE_CENTER	no	T F *(T)*	Perform interactive centering
SEQ.NGS.ALPHA	no	*(000000.0)*	RA of AO NGS Star
SEQ.NGS.COLOR	no	-10..10 *(0.0)*	Gaia BP-RP color
SEQ.NGS.DELTA	no	*(000000.0)*	DEC of AO NGS Star
SEQ.NGS.MAG	no	-2.0..25.0 *(0.0)*	Gaia RPmag of AO NGS star
SEQ.NGS_EXTENDED	no	T F *(F)*	Extended object (AGN-like)
SEQ.NGS_EXTENDED_FULL	no	T F *(F)*	Extended object (planet-like)
SEQ.PRESET	yes	T F *(T)*	Preset Telescope? (T/F)
SEQ.TRACK.REF	no	*.track *()*	AO NGS tracking table file
SEQ.TRACK.TARG	no	*.track *()*	Target object tracking table file
TEL.AG.GUIDESTAR	no	NONE SETUPFILE CATALOGUE *(CATALOGUE)*	Telescope guide star selection
TEL.GS1.ALPHA	no	*(0.)*	RA of telescope guide star
TEL.GS1.DELTA	no	*(0.)*	DEC of telescope guide star
TEL.ROT.OFFANGLE	no	*(0.)*	Position Angle on Sky
TEL.TARG.ADDVELALPHA	yes	-100..100 *(0.0)*	Add Velocity Alpha
TEL.TARG.ADDVELDELTA	yes	-100..100 *(0.0)*	Add Velocity Alpha
TEL.TARG.ALPHA	no	*(0)*	RA
TEL.TARG.DELTA	no	*(0)*	DEC
TEL.TARG.EPOCH	no	-2000..3000 *(2000)*	Epoch
TEL.TARG.EQUINOX	no	-2000..3000 *(2000)*	Equinox
TEL.TARG.PMA	no	-10..10 *(0)*	Proper Motion Alpha
TEL.TARG.PMD	no	-10..10 *(0)*	Proper Motion Delta

Fixed values:

Parameter	Hidden	Value	Label
AOS.AO.MODE	no	Full_AO	AO mode for the template
DPR.CATG	no	ACQUISITION	Data product category
DPR.TECH	no	IMAGE	Data product technique
DPR.TYPE	no	OBJECT	Data product type
INS.AO.NAME	no	NGS_SKY	AO configuration
INS.AOTRACK.NAME	no	NGS_SKY	AO tracking
INS.CAL.NAME	no	OFF	CU configuration
INS.LAMPS.NAME	no	OFF	Lamps configuration
INS.MODE	no	nixLSS	ERIS Instrument Mode
INS.NXCW.NAME	no	13mas-LSS	NIX camera wheel
INS.NXFW.NAME	no	L-Broad	NIX filter wheel
INS.NXPW.NAME	no	Grism	NIX pupil wheel
SEQ.DO.PERSIST.ST	no	F	record persistence data? (T/F)
SEQ.NIX.DET.WINDOWING	no	windowF	NIX Detector windowing Name
SEQ.PUPILTRK	no	F	Pupil tracking mode (T/F)

2.2.13 ERIS_nixSAM_acq_NGS

This template is used for the acquisition of SAM targets. The template does a telescope preset and then sets the pupil-tracking mode sending the spiders to a pre-defined angle, which depends on the SAM mask being used. This angle is chosen to prevent the telescope spiders from intersecting any holes in the mask. The rest of the acquisition is identicalto that of ERIS_nixIMG_acq.

ERIS_nixSAM_acq_NGS.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
DET.DIT	no	0.0..1800.0 *(-)*	Integration time (DIT) for interactive centering
DET.NDIT	no	1..31775 *(-)*	Number of Integrations (NDIT) for interactive centering
DET.READOUT	no	SLOW_GR_UTR FAST_UNCORR *(SLOW_GR_UTR)*	Detector readout mode
INS.NXCW.NAME	no	13mas-JHK 13mas-LM *(13mas-LM)*	NIX camera wheel
INS.NXFW.NAME	no	J H Ks Pa-b Fe-II H2-cont H2-1-0S Br-g K-peak IB-2.42 IB-2.48 Short-Lp Lp Mp Br-a-cont Br-a *(-)*	NIX filter wheel
INS.NXPW.NAME	no	SAM-23 SAM-9 SAM-7 *(SAM-9)*	NIX pupil wheel
SEQ.AO.AUTOEXEC	yes	T F *(T)*	OSF auto-exec
SEQ.AO.BIAS_LIMIT_MAG	yes	0..22 *(17.0)*	Limit magnitude for bias subtraction
SEQ.AO.CAMERA_GAIN_FACTOR	yes	1..100 *(4)*	WFS camera gain bootstrap factor
SEQ.AO.CAMERA_GAIN_FACTOR_FAST	yes	1..200 *(10)*	WFS camera gain bootstrap factor fast
SEQ.AO.CAMERA_MAX_GAIN	yes	1..1000 *(400)*	Max allowed WFS camera gain
SEQ.AO.CAMERA_TARGET_VALUE	yes	1..10000 *(2000)*	WFS camera pixel counts target
SEQ.AO.FLUX_ZEROPOINT	yes	0..1e9 *(2.54e7)*	Zero point flux
SEQ.AO.LIMIT_MAG	yes	0..22 *(16.0)*	Limit magnitude
SEQ.AO.PUPIL_MAX_TIME	yes	0..240 *(120)*	Max allowed time for pupil centering
SEQ.AO.PUPIL_SAMPLES	yes	0..100000 *(1000)*	Samples for pupil centering
SEQ.AO.PUPIL_SKIP	yes	0..100000 *(1000)*	Skip frames for pupil centering
SEQ.AO.PUPIL_THRESHOLD	yes	0..1 *(0.1)*	Threshold for pupil centering
SEQ.AO.SUBAPS_THRESHOLD	yes	0..1 *(0.2)*	Subap illumination threshold
SEQ.AO.TILT_REF	yes	0..1 *(0.0)*	Reference tilt misalignement value
SEQ.AO.TIP_REF	yes	0..1 *(0.0)*	Reference tip misalignment value
SEQ.AO.TN_LOOP	yes	0..100000 *(1000)*	TN loop frames
SEQ.AO.TN_PIXELS	yes	0..10000 *(10)*	TN pixel frames
SEQ.AO.TT_THRESHOLD	yes	0..1 *(0.1)*	Subap tip/tilt misalignement threshold
SEQ.INTERACTIVE_CENTER	no	T F *(T)*	Perform interactive centering
SEQ.NGS.ALPHA	no	*(000000.0)*	RA of AO NGS Star
SEQ.NGS.COLOR	no	-10..10 *(0.0)*	Gaia BP-RP color
SEQ.NGS.DELTA	no	*(000000.0)*	DEC of AO NGS Star
SEQ.NGS.MAG	no	-2.0..25.0 *(0.0)*	Gaia RPmag of AO NGS star
SEQ.NGS_EXTENDED	no	T F *(F)*	Extended object (AGN-like)
SEQ.NGS_EXTENDED_FULL	no	T F *(F)*	Extended object (planet-like)
SEQ.NIX.DET.WINDOWING	no	window2 window4 window5 windowF *(windowF)*	NIX Detector windowing Name
SEQ.PRESET	yes	T F *(T)*	Preset Telescope? (T/F)
TEL.AG.GUIDESTAR	no	NONE SETUPFILE CATALOGUE *(CATALOGUE)*	Telescope guide star selection
TEL.GS1.ALPHA	no	*(0.)*	RA of telescope guide star
TEL.GS1.DELTA	no	*(0.)*	DEC of telescope guide star
TEL.ROT.OFFANGLE	yes	*(0.)*	Position Angle on Sky
TEL.TARG.ADDVELALPHA	yes	-100..100 *(0.0)*	Add Velocity Alpha
TEL.TARG.ADDVELDELTA	yes	-100..100 *(0.0)*	Add Velocity Alpha
TEL.TARG.ALPHA	no	*(0)*	RA
TEL.TARG.DELTA	no	*(0)*	DEC
TEL.TARG.EPOCH	no	-2000..3000 *(2000)*	Epoch
TEL.TARG.EQUINOX	no	-2000..3000 *(2000)*	Equinox
TEL.TARG.PMA	no	-10..10 *(0)*	Proper Motion Alpha
TEL.TARG.PMD	no	-10..10 *(0)*	Proper Motion Delta
Fixed values:			
Parameter	Hidden	Value	Label
AOS.AO.MODE	no	Full_AO	AO mode for the template
DPR.CATG	no	ACQUISITION	Data product category
DPR.TECH	no	IMAGE	Data product technique
DPR.TYPE	no	OBJECT	Data product type
INS.AO.NAME	no	NGS_SKY	AO configuration
INS.AOTRACK.NAME	no	NGS_SKY	AO tracking
INS.CAL.NAME	no	OFF	CU configuration
INS.LAMPS.NAME	no	OFF	Lamps configuration
INS.MODE	no	nixSAM	ERIS Instrument Mode
SEQ.DO.PERSIST.ST	no	F	record persistence data? (T/F)
SEQ.PUPILTRK	no	T	Pupil tracking mode (T/F)

3 ERIS Observations Templates

3.1 IFS (SPIFFIER) Templates

3.1.1 ERIS_ifs_obs_AutoJitter

This template offsets the telescope between exposures according to a random pattern of offsets automatically determined within the template The offsets are distributed randomly within a box whose size is defined by

the parameter SEQ.JITTER.WIDTH (in arc seconds), with the condition that the distance between any two points in a series of ten values (note SEQ.POISSON) is greater than a certain minimum. This is intentionally done to ensure that the 5 frames before and after any frame are spatially not too close and can be safely used for creating sky frames without residual objects for sky subtraction. There is no telescope offset applied for the very first exposure.

ERIS_ifs_obs_AutoJitter.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
DET.DIT	no	0..3600 *(-)*	Detector integration time
DET.NDIT	no	1..100 *(-)*	Number of detector integrations
INS.BAND.NAME	no	J_low J_short J_middle J_long H_low H_short H_middle H_long K_low K_short K_middle K_long *(-)*	SPIFFIER grating
INS.SPXW.NAME	no	25mas 100mas 250mas *(-)*	SPIFFIER spaxel size
SEQ.JITTER.WIDTH	no	0..30 *(-)*	Jitter width
SEQ.NEXPO	no	1..1000 *(1)*	Number of exposures per offset position
SEQ.NOFF	no	1..1000 *(-)*	Number of offset positions
Fixed values:			
Parameter	Hidden	Value	Label
DPR.CATG	no	SCIENCE	Data product category
DPR.TECH	no	IFU,JITTER	Data product technique
DPR.TYPE	no	OBJECT	Data product type
SEQ.POISSON	yes	10	
SEQ.RETURN	no	T	Return to origin? (T/F)

3.1.2 ERIS_ifs_obs_FixedSkyOffset

The template moves the telescope alternatively between ‘object‘ and ‘sky‘ positions (nodding). The ‘object‘ positions are randomly distributed (jittered) around the object (initial telescope position) and within a box whose dimensions are set by the parameter “Jitter box width” (in arcsec). The size of the jitter box should be typically between 4 and 32 times the selected SPAXEL size.

The ‘sky‘ positions are also randomly distributed around a fixed offset position (defined by the parameters “Alpha offset to sky” and “Delta offset to sky”) from the original (target) telescope position. The box dimension of the random ‘sky‘ positions are also set by the parameter “Jitter box width” around the initial ‘sky‘ position, and therefore identical to those of the target jitter box.

Two different object/sky sequence pattern are available. If SEQ.ABBA is ’T’ the pattern will be ABBA,ABBA,ABBA... otherwise it will be ABA,ABA... In the first case (SEQ.ABBA == T) the parameter SEQ.NABCYCLES counts all AB and BA pairs, in the second case it counts all ABA triples.

There is an option to change the “Number of exposures per offset position” such that the template takes NEXPO number of jittered exposures before nodding between the object and sky position. This should be rarely needed for the long exposure times of the SINFONI IFS mode observations.

ERIS_ifs_obs_FixedSkyOffset.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
DET.DIT	no	0..3600 *(-)*	Detector integration time
INS.BAND.NAME	no	J_low J_short J_middle J_long H_low H_short H_middle H_long K_low K_short K_middle K_long *(-)*	SPIFFIER grating
INS.SPXW.NAME	no	25mas 100mas 250mas *(-)*	SPIFFIER spaxel size
SEQ.ABBA	no	T F *(T)*	Implement ABBA object/sky sequence
SEQ.JITTER.WIDTH	no	0..30 *(-)*	Jitter width
SEQ.NABCYCLES	no	1..1000 *(-)*	Number of AB/BA cycles or ABA cycles
SEQ.NDIT.OBJECT	no	1..10000 *(-)*	NDIT for the OBJECT positions
SEQ.NDIT.SKY	no	1..10000 *(-)*	NDIT for the SKY positions
SEQ.NEXPO	no	1..1000 *(1)*	Number of exposures per offset position
TEL.SKY.OFFSETALPHA	no	-800..800 *(0.0)*	Alpha offset to sky
TEL.SKY.OFFSETDELTA	no	-800..800 *(30.0)*	Delta offset to sky
Fixed values:			
Parameter	Hidden	Value	Label
DPR.CATG	no	SCIENCE	Data product category
DPR.TECH	no	IFU,NODDING	Data product technique
DPR.TYPE	no	OBJECT	Data product type
SEQ.POISSON	yes	10	
SEQ.RETURN	no	T	Return to origin? (T/F)

3.1.3 ERIS_ifs_obs_GenericOffset

The GenericOffset template has the flexibility to do any sequence of telescope offsets, either in detector or sky coordinates. The sequence of "Object" and "Sky" observations is defined by the user. The number of integration (NDIT) per detector readout can be selected differently for object and sky positions.

The parameter "Offset coordinate type selection" defines if the user selected offsets are executed with respect to the detector XY coordinates or the sky RA,DEC coordinates. The offsets are defined as list of parameters "List of offsets in RA or X" and "List of offsets in DEC or Y", respectively. The offsets are cumulative - relative to the previous position. If the parameter "Offset coordinate type selection" = "SKY", then the offsets have to be considered and specified as telescope offsets, following the offset conventions and definitions given in section 5.7. If the parameter "Offset coordinate type selection" = "DETECTOR", the offset sequence as given in "List of offsets in RA or X" and "List of offsets in DEC or Y" specifies what the target is doing on the detector.

Additionally the observation type and the number of integrations (NDIT) can be defined for any of the object or sky positions in the parameters "List of observation types (O or S)" and "List of number of integrations (NDIT)", respectively. In case of type "O" the archived data files are flagged as "SCIENCE" and the AO loop is closed for AO observations (NGS, LGS and SE mode). In case of type "S" the archived files are marked as "SKY" and the loop is opened to allow offsets beyond the range of the field selector mirror which images the science field to the spectrograph image slicer while the NGS (TTS) is centered on the WFS.

The total number of exposures is defined by the parameter "Number of offset positions". This number maybe different from the number of elements in the aforementioned lists. Lists do not have to have the same length. If the number of offset exposures is larger than the length of the list, then the list is restarted from the beginning until the correct number of frames have been acquired. The total integration time is DIT times the sum of the NDIT taken at the specified "Number of offset positions". The lists may also be longer than the "Number of offset positions", but these surplus offsets will be ignored by the system. It is good practice to use lists of equal length, or lists which contain only one parameter if one of the parameters shall remain unchanged (like NDIT).

Warning: Make sure that you do not have offset positions for type "O" exposures outside of the range of the field selector.

At the end of the template, the telescope is returned to the original position if the parameter SEQ.RETURN is set to true (T). If not, the telescope is not moved at the end of the template.

ERIS_ifs_obs_GenericOffset.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
DET.DIT	no	0..3600 *(-)*	Detector integration time
DET.NDIT.LIST	no	1..100 *(1)*	List of NDITs
INS.BAND.NAME	no	J_low J_short J_middle J_long H_low H_short H_middle H_long K_low K_short K_middle K_long *(-)*	SPIFFIER grating
INS.SPXW.NAME	no	25mas 100mas 250mas *(-)*	SPIFFIER spaxel size
SEQ.NEXPO	no	1..1000 *(1)*	Number of exposures per offset position
SEQ.NOFF	no	1..1000 *(-)*	Number of offset positions
SEQ.OBSTYPE.LIST	no	O S *(-)*	List of observation types (O or S)
SEQ.OFFSET.COORDS	no	SKY DETECTOR *(-)*	Offset coordinate type selection
SEQ.OFFSET1.LIST	no	-800..800 *(-)*	List of offsets coordinates in RA or X
SEQ.OFFSET2.LIST	no	-800..800 *(-)*	List of offsets coordinates in DEC or Y
Fixed values:			
Parameter	Hidden	Value	Label
DPR.CATG	no	SCIENCE	Data product category
DPR.TECH	no	IFU,NODDING	Data product technique
DPR.TYPE	no	OBJECT	Data product type
SEQ.RETURN	no	T	Return to origin? (T/F)

3.2 Imaging (NIX) Templates

3.2.1 ERIS_nixAPP_obs_GenericOffset

This is similar to ERIS_nixIMG_obs GenericOffset. With the handling of the offsets in pupil tracking mode accounts for most of the differences to ERIS_nixIMG_obs_GenericOffset. APP observing template allows cube mode, moves object around on the detector, but not nodding fully to sky. Note that first object should be aligned on axis, to allow comparison with standard.

ERIS_nixAPP_obs_GenericOffset.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
DET.READOUT	no	SLOW_GR_UTR FAST_UNCORR *(SLOW_GR_UTR)*	Detector readout mode
INS.NXFW.NAME	no	H2-cont H2-1-0S Br-g K-peak IB-2.42 IB-2.48 Br-a-cont Br-a *(-)*	NIX filter wheel
SEQ.CUBE.ST	no	F T *(F)*	Store Data Cube? (T/F)
SEQ.NEXPO	no	1..99 *(1)*	Number of exposures per offset position
SEQ.NIX.DET.WINDOWING	no	window2 window4 windowF *(windowF)*	NIX Detector windowing Name
SEQ.NIX.DIT.LIST	no	0.0..1800.0 *(1 1)*	List of detector integration time
SEQ.NIX.NDIT.LIST	no	1..31775 *(1 1)*	List of number of detector integrations
SEQ.NOFF	no	1..1000 *(-)*	Number of offset positions
SEQ.OBSTYPE.LIST	no	O S *(-)*	List of observation types (O or S)
SEQ.OFFSET.COORDS	no	DETECTOR *(DETECTOR)*	Offset coordinate type selection
SEQ.OFFSET1.LIST	no	-800..800 *(-)*	List of offsets coordinates in RA or X
SEQ.OFFSET2.LIST	no	-800..800 *(-)*	List of offsets coordinates in DEC or Y
Fixed values:			
Parameter	Hidden	Value	Label
DPR.CATG	no	SCIENCE	Data product category
DPR.TECH	no	CORONAGRAPHY,APP	Data product technique
DPR.TYPE	no	OBJECT	Data product type
INS.NXPW.NAME	no	APP	NIX pupil wheel
SEQ.DO.PERSIST.ST	no	T	record persistence data? (T/F)
SEQ.EXT.FOCUS.CU	no	F	T focusOffset Val sent to CU; otherwise, sent to DSM
SEQ.MULTI.SHORT.EXP	no	T	T: multi short exposure, F: single long exposure
SEQ.NIX.FOCUS.POS	no	EXTERNAL	NXDF pos. EXTERNAL: for External Focus ; INTERNAL: for internal Focus; PUPILIMG: for Pupil_IMG
SEQ.NIX.SHUTTER.CLOSE.ST	no	T	at the End of Template, set NXIS=Dark1 (close NIX shutter)? (T/F)
SEQ.RETURN	no	T	Return to origin? (T/F)

3.2.2 ERIS_nixFPC_obs_GenericOffset

This template is similar to ERIS_nixIMG_obs_GenericOffset, but with the precise alignment at the beginning. Filter on filter wheel defines mask on aperture wheel.

ERIS_nixFPC_obs_GenericOffset.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
DET.READOUT	no	SLOW_GR_UTR FAST_UNCORR *(FAST_UNCORR)*	Detector readout mode
INS.NXFW.NAME	no	Short-Lp Lp Mp Br-a-cont Br-a *(-)*	NIX filter wheel
INS.NXPW.NAME	no	Lyot Lyot-ND *(Lyot)*	NIX pupil wheel
SEQ.NEXPO	no	1..99 *(1)*	Number of exposures per offset position
SEQ.NIX.DET.WINDOWING	no	window1 window3 *(window1)*	NIX Detector windowing Name
SEQ.NIX.DIT.LIST	no	0.0..1800.0 *(1 1)*	List of detector integration time
SEQ.NIX.NDIT.LIST	no	1..31775 *(1 1)*	List of number of detector integrations
SEQ.NOFF	no	1..1000 *(-)*	Number of offset positions
SEQ.OBSTYPE.LIST	no	O S F*(-)*	List of observation types (O, S, or F)
SEQ.OFFSET.COORDS	no	DETECTOR *(DETECTOR)*	Offset coordinate type selection
SEQ.OFFSET1.LIST	no	-800..800 *(-)*	List of offsets coordinates in RA or X
SEQ.OFFSET2.LIST	no	-800..800 *(-)*	List of offsets coordinates in DEC or Y
SEQ.QACITS.ST	yes	T F *(T)*	Perform de-centring correction
Fixed values:			
Parameter	Hidden	Value	Label
DPR.CATG	no	SCIENCE	Data product category
DPR.TECH	no	CORONAGRAPHY,FPC	Data product technique
DPR.TYPE	no	OBJECT	Data product type
INS.NXCW.NAME	no	13mas-LM	NIX camera wheel
SEQ.CUBE.ST	yes	T	Store Data Cube? (T/F)
SEQ.DO.PERSIST.ST	yes	F	record persistence data? (T/F)
SEQ.EXT.FOCUS.CU	no	F	T focusOffset Val sent to CU; otherwise, sent to DSM
SEQ.MULTI.SHORT.EXP	no	T	T: multi short exposure, F: single long exposure
SEQ.NIX.FOCUS.POS	no	EXTERNAL	NXDF pos. EXTERNAL: for External Focus ; INTERNAL: for internal Focus; PUPILIMG: for Pupil_IMG
SEQ.NIX.SHUTTER.CLOSE.ST	no	T	at the End of Template, set NXIS=Dark1 (close NIX shutter)? (T/F)
SEQ.QACITS.PERIOD	no	5	Period for QACITS corrections
SEQ.RETURN	no	T	Return to origin? (T/F)
SEQ.VORTEX.DIT	no	-1	DIT for VORTEX image
SEQ.VORTEX.NDIT	no	-1	Number of VORTEX DIT frames

3.2.3 ERIS_nixIMG_obs_AutoJitter

This template offsets the telescope between exposures according to a pseudo-random sequence of offsets (Jitter) automatically determined by the template. It is ideal for long integrations on sparse fields, and does not require a long list of offsets to be defined. Options include saving data as a cube.

ERIS_nixIMG_obs_AutoJitter.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
DET.DIT	no	0.0..1800 *(-)*	Detector integration time
DET.NDIT	no	1..31775 *(-)*	Number of detector integrations
DET.READOUT	no	SLOW_GR_UTR FAST_UNCORR *(SLOW_GR_UTR)*	Detector readout mode
INS.NXCW.NAME	no	13mas-JHK 27mas-JHK 13mas-LM *(-)*	NIX camera wheel
INS.NXFW.NAME	no	J H Ks Pa-b Fe-II H2-cont H2-1-0S Br-g K-peak IB-2.42 IB-2.48 Short-Lp Lp Mp Br-a-cont Br-a *(-)*	NIX filter wheel
INS.NXPW.NAME	no	JHK-pupil Blocking LM-pupil Spider ND *(-)*	NIX pupil wheel
SEQ.CUBE.ST	no	F T *(F)*	Store Data Cube? (T/F)
SEQ.JITTER.WIDTH	no	0..30 *(-)*	Jitter width
SEQ.NEXPO	no	1..1000 *(1)*	Number of exposures per offset position
SEQ.NIX.DET.WINDOWING	no	window2 window4 window5 windowF *(windowF)*	NIX Detector windowing Name
SEQ.NOFF	no	1..1000 *(-)*	Number of offset positions
Fixed values:			
Parameter	Hidden	Value	Label
DPR.CATG	no	SCIENCE	Data product category
DPR.TECH	no	IMAGE,JITTER	Data product technique
DPR.TYPE	no	OBJECT	Data product type
SEQ.DO.PERSIST.ST	no	T	record persistence data? (T/F)
SEQ.EXT.FOCUS.CU	no	F	T focusOffset Val sent to CU; otherwise, sent to DSM
SEQ.MULTI.SHORT.EXP	no	T	T: multi short exposure, F: single long exposure
SEQ.NIX.FOCUS.POS	no	EXTERNAL	NXDF pos. EXTERNAL: for External Focus ; INTERNAL: for internal Focus; PUPILIMG: for Pupil_IMG
SEQ.NIX.SHUTTER.CLOSE.ST	no	T	at the End of Template, set NXIS=Dark1 (close NIX shutter)? (T/F)
SEQ.POISSON	no	10	
SEQ.RETURN	no	T	Return to origin? (T/F)

3.2.4 ERIS_nixIMG_obs_GenericOffset

This template has the flexibility to do any sequence of telescope offsets, either in detector or sky coordinates. Telescope offsets are defined as lists with the parameters of offsets in RA or X and List of offsets in DEC or Y. The offsets are relative to the previous position and are in RA and DEC or in X and Y depending on the Offset Coordinates parameter, and are defined in arcsec. Additionally, the observation type can be defined for each image, and is entered as a list in the parameter "Observation Type (O or S)." O stands for Object and assigns the DPR.TYPE header keyword to OBJECT. S stands for Sky and assigns the DPR.TYPE header keyword to SKY. For Object (obType==OBJ), the AO loop is always closed. But, for SKY (obType==SKY), the template has an option to either keep AO closed (the offset must then be less than a predefined limit) or set AO in pause mode, by defining ON or OFF in another parameter list (obAOFlag).

ERIS_nixIMG_obs_GenericOffset.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
DET.READOUT	no	SLOW_GR_UTR FAST_UNCORR *(SLOW_GR_UTR)*	Detector readout mode
INS.NXCW.NAME	no	13mas-JHK 27mas-JHK 13mas-LM *(-)*	NIX camera wheel
INS.NXFW.NAME	no	J H Ks Pa-b Fe-II H2-cont H2-1-0S Br-g K-peak IB-2.42 IB-2.48 Short-Lp Lp Mp Br-a-cont Br-a *(-)*	NIX filter wheel
INS.NXPW.NAME	no	JHK-pupil Blocking LM-pupil Spider ND *(-)*	NIX pupil wheel
SEQ.CUBE.ST	no	F T *(F)*	Store Data Cube? (T/F)
SEQ.NEXPO	no	1..99 *(1)*	Number of exposures per offset position
SEQ.NIX.DET.WINDOWING	no	window2 window4 window5 windowF *(windowF)*	NIX Detector windowing Name
SEQ.NIX.DIT.LIST	no	0.0..1800.0 *(1 1)*	List of detector integration time
SEQ.NIX.NDIT.LIST	no	1..31775 *(1 1)*	List of number of detector integrations
SEQ.NOFF	no	1..1000 *(-)*	Number of offset positions
SEQ.OBSTYPE.LIST	no	O S *(-)*	List of observation types (O or S)
SEQ.OFFSET.COORDS	no	SKY DETECTOR *(-)*	Offset coordinate type selection

SEQ.OFFSET1.LIST	no	-800..800 *(-)*	List of offsets coordinates in RA or X
SEQ.OFFSET2.LIST	no	-800..800 *(-)*	List of offsets coordinates in DEC or Y
Fixed values:			
Parameter	Hidden	Value	Label
DPR.CATG	no	SCIENCE	Data product category
DPR.TECH	no	IMAGE	Data product technique
DPR.TYPE	no	OBJECT	Data product type
SEQ.DO.PERSIST.ST	no	T	record persistence data? (T/F)
SEQ.EXT.FOCUS.CU	no	F	T focusOffset Val sent to CU; otherwise, sent to DSM
SEQ.MULTI.SHORT.EXP	no	T	T: multi short exposure, F: single long exposure
SEQ.NIX.FOCUS.POS	no	EXTERNAL	NXDF pos. EXTERNAL: for External Focus ; INTERNAL: for internal Focus; PUPILIMG: for Pupil_IMG
SEQ.NIX.SHUTTER.CLOSE.ST	no	T	at the End of Template, set NXIS=Dark1 (close NIX shutter)? (T/F)
SEQ.RETURN	no	T	Return to origin? (T/F)

3.2.5 ERIS_nixLSS_obs_AutoJitterOnSlit

This template measures the spectrum of objects in the slit in such a way that the sky background spectrum can be derived as well. This is done by jittering the target object up and down the slit in the same way as is done for imaging. The observer would specify a jitter box, and there may also need to be a minimum distance between successive jitters.

ERIS_nixLSS_obs_AutoJitterOnSlit.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
DET.DIT	no	0.0..1800 *(-)*	Detector integration time
DET.NDIT	no	1..31775 *(-)*	Number of detector integrations
DET.READOUT	no	SLOW_GR_UTR FAST_UNCORR *(SLOW_GR_UTR)*	Detector readout mode
SEQ.CUBE.ST	no	F T *(F)*	Store Data Cube? (T/F)
SEQ.JITTER.WIDTH	no	0..12 *(-)*	Jitter width
SEQ.NEXPO	no	1..1000 *(1)*	Number of exposures per offset position
SEQ.NOFF	no	1..1000 *(-)*	Number of offset positions
Fixed values:			
Parameter	Hidden	Value	Label
DPR.CATG	no	SCIENCE	Data product category
DPR.TECH	no	SPECTRUM,LSS,JITTER	Data product technique
DPR.TYPE	no	OBJECT	Data product type
INS.NXAW.NAME	no	Slit	NIX aperture wheel, need to match NXCW, NIX.OPTI2
INS.NXCW.NAME	no	13mas-LSS	NIX camera wheel
INS.NXFW.NAME	no	L-Broad	NIX filter wheel
INS.NXPW.NAME	no	Grism	NIX pupil wheel
SEQ.DO.PERSIST.ST	no	T	record persistence data? (T/F)
SEQ.EXT.FOCUS.CU	no	F	T focusOffset Val sent to CU; otherwise, sent to DSM
SEQ.MULTI.SHORT.EXP	no	T	T: multi short exposure, F: single long exposure
SEQ.NIX.DET.WINDOWING	no	windowF	NIX Detector windowing Name
SEQ.NIX.FOCUS.POS	no	EXTERNAL	NXDF pos. EXTERNAL: for External Focus ; INTERNAL: for internal Focus; PUPILIMG: for Pupil_IMG
SEQ.NIX.SHUTTER.CLOSE.ST	no	T	at the End of Template, set NXIS=Dark1 (close NIX shutter)? (T/F)
SEQ.NIX.SLITTILT	no	1.95	NIX Slit Tilted angle in degree
SEQ.POISSON	no	10	
SEQ.RETURN	no	T	Return to origin? (T/F)

3.2.6 ERIS_nixLSS_obs_GenericOffset

This template is similar to ERIS_nixIMG_obs_GenericOffset. Its purpose is to take a sequence of spectra with the object placed at a range of specified offsets along the slit. Filter on filter wheel defines mask on pupile wheel.

ERIS_nixLSS_obs_GenericOffset.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
DET.READOUT	no	SLOW_GR_UTR FAST_UNCORR *(SLOW_GR_UTR)*	Detector readout mode
SEQ.CUBE.ST	no	F T *(F)*	Store Data Cube? (T/F)
SEQ.NEXPO	no	1..99 *(1)*	Number of exposures per offset position
SEQ.NIX.DIT.LIST	no	0.0..1800.0 *(1 1)*	List of detector integration time
SEQ.NIX.NDIT.LIST	no	1..31775 *(1 1)*	List of number of detector integrations
SEQ.NOFF	no	1..1000 *(-)*	Number of offset positions
SEQ.OBSTYPE.LIST	no	O S *(-)*	List of observation types (O or S)
SEQ.OFFSET1.LIST	no	-800..800 *(-)*	List of offsets coordinates parallel to the slit

SEQ.OFFSET2.LIST	no	-800..800 *(-)*	List of offsets coordinates perpendicular to the slit
Fixed values:			
Parameter	Hidden	Value	Label
DPR.CATG	no	SCIENCE	Data product category
DPR.TECH	no	SPECTRUM,LSS	Data product technique
DPR.TYPE	no	OBJECT	Data product type
INS.NXAW.NAME	no	Slit	NIX aperture wheel, need to match NXCW, NIX.OPTI2
INS.NXCW.NAME	no	13mas-LSS	NIX camera wheel
INS.NXFW.NAME	no	L-Broad	NIX filter wheel
INS.NXPW.NAME	no	Grism	NIX pupil wheel
SEQ.DO.PERSIST.ST	no	T	record persistence data? (T/F)
SEQ.EXT.FOCUS.CU	no	F	T focusOffset Val sent to CU; otherwise, sent to DSM
SEQ.MULTI.SHORT.EXP	no	T	T: multi short exposure, F: single long exposure
SEQ.NIX.DET.WINDOWING	no	windowF	NIX Detector windowing Name
SEQ.NIX.FOCUS.POS	no	EXTERNAL	NXDF pos. EXTERNAL: for External Focus ; INTERNAL: for internal Focus; PUPILIMG: for Pupil_IMG
SEQ.NIX.SHUTTER.CLOSE.ST	no	T	at the End of Template, set NXIS=Dark1 (close NIX shutter)? (T/F)
SEQ.NIX.SLITTILT	no	1.95	NIX Slit Tilted angle in degree
SEQ.OFFSET.COORDS	no	SKY	Offset coordinate type selection
SEQ.RETURN	no	T	Return to origin? (T/F)

3.2.7 ERIS_nixSAM_obs_GenericOffset

This template is similar to ERIS_nixIMG_obs_GenericOffset. However not compulsory, SAM will use cube mode for data storage as a default. This, and the handling of the offsets in pupil tracking mode, account for most of the differences with ERIS_nixIMG_obs_GenericOffset.

ERIS_nixSAM_obs_GenericOffset.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
DET.READOUT	no	SLOW_GR_UTR FAST_UNCORR *(SLOW_GR_UTR)*	Detector readout mode
INS.NXCW.NAME	no	13mas-JHK 13mas-LM *(-)*	NIX camera wheel
INS.NXFW.NAME	no	J H Ks Pa-b Fe-II H2-cont H2-1-0S Br-g K-peak IB-2.42 IB-2.48 Short-Lp Lp Mp Br-a-cont Br-a *(-)*	NIX filter wheel
INS.NXPW.NAME	no	SAM-23 SAM-9 SAM-7 *(-)*	NIX pupil wheel
SEQ.CUBE.ST	no	F T *(F)*	Store Data Cube? (T/F)
SEQ.NEXPO	no	1..99 *(1)*	Number of exposures per offset position
SEQ.NIX.DET.WINDOWING	no	window2 window4 window5 windowF *(windowF)*	NIX Detector windowing Name
SEQ.NIX.DIT.LIST	no	0.0..1800.0 *(1 1)*	List of detector integration time
SEQ.NIX.NDIT.LIST	no	1..31775 *(1 1)*	List of number of detector integrations
SEQ.NOFF	no	1..1000 *(-)*	Number of offset positions
SEQ.OBSTYPE.LIST	no	O S *(-)*	List of observation types (O or S)
SEQ.OFFSET.COORDS	no	DETECTOR *(DETECTOR)*	Offset coordinate type selection
SEQ.OFFSET1.LIST	no	-800..800 *(-)*	List of offsets coordinates in RA or X
SEQ.OFFSET2.LIST	no	-800..800 *(-)*	List of offsets coordinates in DEC or Y
Fixed values:			
Parameter	Hidden	Value	Label
DPR.CATG	no	SCIENCE	Data product category
DPR.TECH	no	IMAGE,SAM	Data product technique
DPR.TYPE	no	OBJECT	Data product type
SEQ.DO.PERSIST.ST	no	T	record persistence data? (T/F)
SEQ.EXT.FOCUS.CU	no	F	T focusOffset Val sent to CU; otherwise, sent to DSM
SEQ.MULTI.SHORT.EXP	no	T	T: multi short exposure, F: single long exposure
SEQ.NIX.FOCUS.POS	no	EXTERNAL	NXDF pos. EXTERNAL: for External Focus ; INTERNAL: for internal Focus; PUPILIMG: for Pupil_IMG
SEQ.NIX.SHUTTER.CLOSE.ST	no	T	at the End of Template, set NXIS=Dark1 (close NIX shutter)? (T/F)
SEQ.RETURN	no	T	Return to origin? (T/F)

4 ERIS Calibration Templates

4.1 IFS (SPIFFIER) Templates

4.1.1 ERIS_ifs_cal_Arcs

Acquire emission-line lamp spectra to determine the wavelength scale for each spatial pixel. The required pen ray lamps (Ne, Ar, Kr or Xe) and DIT are automatically selected by the template according to the BAND and SPXW setting.

Take NEXPO exposures for every pen ray lamps setting and NEXPO exposures for every unique (DIT) dark settting.

ERIS_ifs_cal_Arcs.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
INS.BAND.NAME	no	J_low J_short J_middle J_long H_low H_short H_middle H_long K_low K_short K_middle K_long *(-)*	SPIFFIER grating
INS.SPXW.NAME	no	25mas 100mas 250mas *(-)*	SPIFFIER spaxel size
SEQ.NEXPO	no	1..99 *(1)*	Number of exposures
SEQ.PERS.DATA	no	T F *(T)*	Record persistence data? (T/F)
Fixed values:			
Parameter	Hidden	Value	Label
DPR.CATG	no	CALIB	Data product category
DPR.TECH	no	IFU	Data product technique
DPR.TYPE	no	WAVE	Data product type

4.1.2 ERIS_ifs_cal_Darks

Create master dark frames for each exposure time (DIT $*$ NDIT sequence) used for the science observations. Take NEXPO exposures with the instrument shutter closed, for each exposure time used for the science observations.

ERIS_ifs_cal_Darks.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
DET.DIT	no	0..3600 *(-)*	Detector integration time
DET.NDIT	no	1..100 *(-)*	Number of detector integrations
SEQ.NEXPO	no	1..99 *(1)*	Number of exposures
Fixed values:			
Parameter	Hidden	Value	Label
DPR.CATG	no	CALIB	Data product category
DPR.TECH	no	IMAGE	Data product technique
DPR.TYPE	no	DARK	Data product type

4.1.3 ERIS_ifs_cal_GenericOffset

See description of ERIS_ifs_obs_GenericOffset template.

This calibration template will change the following FITS header keywords:

- DPR.CATG to "CALIB"
- DPR.TYPE to "CALIBRATOR"

ERIS_ifs_cal_GenericOffset.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
DET.DIT	no	0..3600 *(-)*	Detector integration time
DET.NDIT.LIST	no	1..100 *(1)*	List of NDITs
INS.BAND.NAME	no	J_low J_short J_middle J_long H_low H_short H_middle H_long K_low K_short K_middle K_long *(-)*	SPIFFIER grating
INS.SPXW.NAME	no	25mas 100mas 250mas *(-)*	SPIFFIER spaxel size
SEQ.NEXPO	no	1..1000 *(1)*	Number of exposures per offset position
SEQ.NOFF	no	1..1000 *(-)*	Number of offset positions

SEQ.OBSTYPE.LIST	no	O S *(-)*	List of observation types (O or S)
SEQ.OFFSET.COORDS	no	SKY DETECTOR *(-)*	Offset coordinate type selection
SEQ.OFFSET1.LIST	no	-800..800 *(-)*	List of offsets coordinates in RA or X
SEQ.OFFSET2.LIST	no	-800..800 *(-)*	List of offsets coordinates in DEC or Y
Fixed values:			
Parameter	Hidden	Value	Label
DPR.CATG	no	CALIB	Data product category
DPR.TECH	no	IFU,NODDING	Data product technique
DPR.TYPE	no	CALIBRATOR	Data product type
SEQ.RETURN	no	T	Return to origin? (T/F)

4.1.4 ERIS_ifs_cal_LampFlats

Provide high SNR flat field exposures for the correction of pixel-to-pixel sensitivity of each detector pixel for each requested BAND/SCALE combination.

When the DET.DIT and/or the QTH.INTENS is set to 0.0 an optimized value for the requested setting will be chosen driven by the BAND/SCALE combination. The list of BAND/SCALE combinations is sorted according the flat lamp intensity to minimize the flat lamp stabilization times.

For every requested BAND/SCALE combination take NEXPO exposures with the calibration unit set towards the flat lamp and NEXPO exposures with the lamp off.

ERIS_ifs_cal_LampFlats.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
DET.DIT	no	0..3600 *(0.)*	Detector integration time
INS.BAND.LIST	no	J_short J_middle J_long H_short H_middle H_long K_short K_middle K_long J_low H_low K_low *(J_short J_middle J_long H_short H_middle H_long K_short K_middle K_long H_low K_low J_low)*	List of SPIFFIER bands to be processed
INS.QTH.INTENS	no	0..100 *(0.)*	Quartz halogen lamp intensity in percentage
INS.SCALE.LIST	no	25mas 100mas 250mas *(250mas)*	List of SPIFFIER pixel scales to be processed
SEQ.NEXPO	no	1..99 *(1)*	Number of exposures
SEQ.PERS.DATA	no	T F *(T)*	Record persistence data? (T/F)
Fixed values:			
Parameter	Hidden	Value	Label
DPR.CATG	no	CALIB	Data product category
DPR.TECH	no	IFU	Data product technique
DPR.TYPE	no	FLAT	Data product type

4.1.5 ERIS_ifs_cal_PSF

Determine instrument/AO point spread function. Take observations of a PSF standard, typically NEXPO exposures on source and NEXPO exposures off-source for background subtraction, depending on the star's brightness.

This template uses the same script as ERIS_ifs_obs_GenericOffset one. See description of ERIS_ifs_obs_GenericOffset template. This calibration template will change the following FITS header keywords: - DPR.CATG to "CALIB" - DPR.TYPE to "PSF-CALIBRATOR"

ERIS_ifs_cal_PSF.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
DET.DIT	no	0..3600 *(-)*	Detector integration time
DET.NDIT.LIST	no	1..100 *(1)*	List of NDITs
INS.BAND.NAME	no	J_low J_short J_middle J_long H_low H_short H_middle H_long K_low K_short K_middle K_long *(-)*	SPIFFIER grating
INS.SPXW.NAME	no	25mas 100mas 250mas *(-)*	SPIFFIER spaxel size
SEQ.NEXPO	no	1..1000 *(1)*	Number of exposures per offset position
SEQ.NOFF	no	1..1000 *(-)*	Number of offset positions
SEQ.OBSTYPE.LIST	no	O S *(-)*	List of observation types (O or S)
SEQ.OFFSET.COORDS	no	SKY DETECTOR *(-)*	Offset coordinate type selection
SEQ.OFFSET1.LIST	no	-800..800 *(-)*	List of offsets coordinates in RA or X
SEQ.OFFSET2.LIST	no	-800..800 *(-)*	List of offsets coordinates in DEC or Y
Fixed values:			
Parameter	Hidden	Value	Label

DPR.CATG	no	CALIB	Data product category
DPR.TECH	no	IFU,NODDING	Data product technique
DPR.TYPE	no	PSF-CALIBRATOR	Data product type
SEQ.RETURN	no	T	Return to origin? (T/F)

4.1.6 ERIS_ifs_cal_SpecPhot

This stemplate is similar to ERIS_ifs_obs_GenericOffset but it is used to observe spectrophotometric standards.

ERIS_ifs_cal_SpecPhot.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
DET.DIT	no	0..3600 *(-)*	Detector integration time
DET.NDIT.LIST	no	1..100 *(1)*	List of NDITs
INS.BAND.NAME	no	J_low J_short J_middle J_long H_low H_short H_middle H_long K_low K_short K_middle K_long *(-)*	SPIFFIER grating
INS.SPXW.NAME	no	25mas 100mas 250mas *(-)*	SPIFFIER spaxel size
SEQ.NEXPO	no	1..1000 *(1)*	Number of exposures per offset position
SEQ.NOFF	no	1..1000 *(-)*	Number of offset positions
SEQ.OBSTYPE.LIST	no	O S *(-)*	List of observation types (O or S)
SEQ.OFFSET.COORDS	no	SKY DETECTOR *(-)*	Offset coordinate type selection
SEQ.OFFSET1.LIST	no	-800..800 *(-)*	List of offsets coordinates in RA or X
SEQ.OFFSET2.LIST	no	-800..800 *(-)*	List of offsets coordinates in DEC or Y
Fixed values:			
Parameter	Hidden	Value	Label
DPR.CATG	no	CALIB	Data product category
DPR.TECH	no	IFU,NODDING	Data product technique
DPR.TYPE	no	STD,FLUX	Data product type
SEQ.RETURN	no	T	Return to origin? (T/F)

4.1.7 ERIS_ifs_cal_StandardStar

Correct for the atmospheric (and instrument) transmission transmission in the observed science data. Photometric calibration is achieved by using telluric standards of known magnitudes. Take observations of a standard star, typically NEXPO exposures on source and NEXPO exposures off-source for background subtraction, depending on the star's brightness.

This template uses the same script as ERIS_ifs_obs_GenericOffset one. See description of ERIS_ifs_obs_GenericOffset template. This calibration template will change the following FITS header keywords:

- DPR.CATG to "CALIB"
- DPR.TYPE to "STD

ERIS_ifs_cal_StandardStar.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
DET.DIT	no	0..3600 *(-)*	Detector integration time
DET.NDIT.LIST	no	1..100 *(1)*	List of NDITs
INS.BAND.NAME	no	J_low J_short J_middle J_long H_low H_short H_middle H_long K_low K_short K_middle K_long *(-)*	SPIFFIER grating
INS.SPXW.NAME	no	25mas 100mas 250mas *(-)*	SPIFFIER spaxel size
SEQ.NEXPO	no	1..1000 *(1)*	Number of exposures per offset position
SEQ.NOFF	no	1..1000 *(-)*	Number of offset positions
SEQ.OBSTYPE.LIST	no	O S *(-)*	List of observation types (O or S)
SEQ.OFFSET.COORDS	no	SKY DETECTOR *(-)*	Offset coordinate type selection
SEQ.OFFSET1.LIST	no	-800..800 *(-)*	List of offsets coordinates in RA or X
SEQ.OFFSET2.LIST	no	-800..800 *(-)*	List of offsets coordinates in DEC or Y
Fixed values:			
Parameter	Hidden	Value	Label
DPR.CATG	no	CALIB	Data product category
DPR.TECH	no	IFU,NODDING	Data product technique
DPR.TYPE	no	STD	Data product type
SEQ.RETURN	no	T	Return to origin? (T/F)

4.2 Imaging (NIX) Templates

4.2.1 ERIS_nix_cal_Darks

This is standard ESO routine to observe darks. Obtain a master dark frame that can be subtracted from other frames to remove bias and pattern noise.

ERIS_nix_cal_Darks.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
DET.READOUT	no	SLOW_GR_UTR FAST_UNCORR *(SLOW_GR_UTR)*	Detector readout mode
DPR.CATG	yes	PRE-IMAGE SCIENCE CALIB TEST *(CALIB)*	Data product category
SEQ.CUBE.ST	no	F T *(F)*	Store Data Cube? (T/F)
SEQ.NEXPO	no	1..99 *(1)*	Number of exposures per DIT
SEQ.NIX.DET.WINDOWING	no	window1 window2 window3 window4 window5 windowF *(windowF)*	NIX Detector windowing Name
SEQ.NIX.DIT.LIST	no	0.0..1800.0 *(1 1)*	List of detector integration time
SEQ.NIX.NDIT.LIST	no	1..31775 *(1 1)*	List of number of detector integrations
Fixed values:			
Parameter	Hidden	Value	Label
DPR.TECH	no	IMAGE	Data product technique
DPR.TYPE	no	DARK	Data product type

4.2.2 ERIS_nixIMG_cal_Astrom

This template is used to obtain flat images for NIX with the calibration unit QTH lamp during day time. As INS.NXFW.NAME and INS.NXCW.NAME suggest, this is only applicable to < 2.5 um filters. For long wavelength (> 2.5 um) filters see ERIS_nixIMG_cal_SkyFlats. The data products are series of (SEQ.NEXPO) flat and dark exposures, from which the instrument pipeline is used to generate low and high frequency master flatfields for a given instrument configuration.

ERIS_nixIMG_cal_LampFlats.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
DET.READOUT	no	SLOW_GR_UTR FAST_UNCORR *(SLOW_GR_UTR)*	Detector readout mode
INS.NXCW.NAME	no	13mas-JHK 27mas-JHK *(-)*	NIX camera wheel
SEQ.NEXPO	no	1..99 *(1)*	Number of exposures per DIT or change from the List
SEQ.NIX.DIT.LIST	no	0.0..1800.0 *(1 1)*	List of detector integration time
SEQ.NIX.NDIT.LIST	no	1..31775 *(1 1)*	List of number of detector integrations
SEQ.NIX.NXFW.LIST	no	J H Ks Pa-b Fe-II H2-cont H2-1-0S Br-g K-peak IB-2.42 IB-2.48 *(-)*	List of filter wheel named positions
SEQ.NIX.NXPW.LIST	no	JHK-pupil Blocking *(-)*	List of pupil wheel named positions
SEQ.NONXFWPOS	no	1..11 *(-)*	Number of NIX filter wheel positions
SEQ.QTH.INTENS.LIST	no	0..100 *(-)*	List of Quartz halogen lamp intensity in percentage
Fixed values:			
Parameter	Hidden	Value	Label
DPR.CATG	no	CALIB	Data product category
DPR.TECH	no	IMAGE	Data product technique
DPR.TYPE	no	FLAT,LAMP	Data product type
SEQ.CUBE.ST	no	F	Store Data Cube? (T/F)
SEQ.DO.PERSIST.ST	no	T	record persistence data? (T/F)
SEQ.EXT.FOCUS.CU	no	T	T focusOffset Val sent to CU; otherwise, sent to DSM
SEQ.MULTI.SHORT.EXP	no	T	T: multi short exposure, F: single long exposure
SEQ.NIX.FOCUS.POS	no	EXTERNAL	NXDF pos. EXTERNAL: for External Focus ; INTERNAL: for internal Focus; PUPILIMG: for Pupil_IMG

4.2.3 ERIS_nixIMG_cal_LampFlats

This template is used to obtain flat images for NIX with the calibration unit QTH lamp during day time. As INS.NXFW.NAME and INS.NXCW.NAME suggest, this is only applicable to < 2.5 um filters. For long wavelength (> 2.5 um) filters see ERIS_nixIMG_cal_SkyFlats. The data products are series of (SEQ.NEXPO) flat and dark exposures, from which the instrument pipeline is used to generate low and high frequency master flatfields for a given instrument configuration.

ERIS_nixIMG_cal_LampFlats.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
DET.READOUT	no	SLOW_GR_UTR FAST_UNCORR *(SLOW_GR_UTR)*	Detector readout mode
INS.NXCW.NAME	no	13mas-JHK 27mas-JHK *(-)*	NIX camera wheel
SEQ.NEXPO	no	1..99 *(1)*	Number of exposures per DIT or change from the List
SEQ.NIX.DIT.LIST	no	0.0..1800.0 *(1 1)*	List of detector integration time
SEQ.NIX.NDIT.LIST	no	1..31775 *(1 1)*	List of number of detector integrations
SEQ.NIX.NXFW.LIST	no	J H Ks Pa-b Fe-II H2-cont H2-1-0S Br-g K-peak IB-2.42 IB-2.48 *(-)*	List of filter wheel named positions
SEQ.NIX.NXPW.LIST	no	JHK-pupil Blocking *(-)*	List of pupil wheel named positions
SEQ.NONXFWPOS	no	1..11 *(-)*	Number of NIX filter wheel positions
SEQ.QTH.INTENS.LIST	no	0..100 *(-)*	List of Quartz halogen lamp intensity in percentage
Fixed values:			
Parameter	Hidden	Value	Label
DPR.CATG	no	CALIB	Data product category
DPR.TECH	no	IMAGE	Data product technique
DPR.TYPE	no	FLAT,LAMP	Data product type
SEQ.CUBE.ST	no	F	Store Data Cube? (T/F)
SEQ.DO.PERSIST.ST	no	T	record persistence data? (T/F)
SEQ.EXT.FOCUS.CU	no	T	T focusOffset Val sent to CU; otherwise, sent to DSM
SEQ.MULTI.SHORT.EXP	no	T	T: multi short exposure, F: single long exposure
SEQ.NIX.FOCUS.POS	no	EXTERNAL	NXDF pos. EXTERNAL: for External Focus ; INTERNAL: for internal Focus; PUPILIMG: for Pupil_IMG

4.2.4 ERIS_nixIMG_cal_SkyFlats

The calibration unit does not provide enough flux for a lamp flat field to be taken for L and M. Hence, for L and M, the flat field is obtained by taking a series of measurements of the sky. At the beginning of the template, the user is asked to adjust DITs in one filter in order to achieve optical count rates (TBD). A multiplicative factor is determined from the ratio of the new to the old DIT and applied to the predefined DITs for each individual filter.

ERIS_nixIMG_cal_SkyFlats.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
DET.DIT	no	0.0..1800 *(-)*	Detector integration time
DET.NDIT	no	1..31775 *(-)*	Number of detector integrations
DET.READOUT	no	SLOW_GR_UTR FAST_UNCORR *(SLOW_GR_UTR)*	Detector readout mode
INS.NXFW.NAME	no	Short-Lp Lp Mp Br-a-cont Br-a L-Broad *(-)*	NIX filter wheel
INS.NXPW.NAME	no	LM-pupil Spider *(-)*	NIX pupil wheel
SEQ.CUBE.ST	no	F T *(F)*	Store Data Cube? (T/F)
SEQ.JITTER.WIDTH	no	0..30 *(-)*	Jitter width
SEQ.NEXPO	no	1..1000 *(1)*	Number of exposures
SEQ.NIX.DET.WINDOWING	no	window1 window2 window3 window4 window5 windowF *(windowF)*	NIX Detector windowing Name
SEQ.NOFF	no	1..1000 *(-)*	Number of offset positions
SEQ.SET.TELSOUTH.ST	no	F T *(T)*	TEL point to azimuth of 0/180? (T/F)
Fixed values:			
Parameter	Hidden	Value	Label
DPR.CATG	no	CALIB	Data product category
DPR.TECH	no	IMAGE	Data product technique
DPR.TYPE	no	FLAT,SKY	Data product type
INS.NXCW.NAME	no	13mas-LM	NIX camera wheel
SEQ.DO.PERSIST.ST	no	T	record persistence data? (T/F)
SEQ.EXT.FOCUS.CU	no	F	T focusOffset Val sent to CU; otherwise, sent to DSM
SEQ.MULTI.SHORT.EXP	no	T	T: multi short exposure, F: single long exposure
SEQ.NIX.FOCUS.POS	no	EXTERNAL	NXDF pos. EXTERNAL: for External Focus ; INTERNAL: for internal Focus; PUPILIMG: for Pupil_IMG
SEQ.NIX.SHUTTER.CLOSE.ST	no	T	at the End of Template, set NXIS=Dark1 (close NIX shutter)? (T/F)
SEQ.POISSON	no	10	
SEQ.RETURN	no	T	Return to origin? (T/F)

4.2.5 ERIS_nixIMG_cal_StandardStar

This template is similar to ERIS_nixIMG_obs_GenericOffset but for a standard star, necessary to ensure correct header keywords.

ERIS_nixIMG_cal_StandardStar.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
DET.READOUT	no	SLOW_GR_UTR FAST_UNCORR *(SLOW_GR_UTR)*	Detector readout mode
INS.NXCW.NAME	no	13mas-JHK 27mas-JHK 13mas-LM *(-)*	NIX camera wheel
INS.NXFW.NAME	no	J H Ks Pa-b Fe-II H2-cont H2-1-0S Br-g K-peak IB-2.42 IB-2.48 Short-Lp Lp Mp Br-a-cont Br-a *(-)*	NIX filter wheel
INS.NXPW.NAME	no	JHK-pupil Blocking LM-pupil Spider ND *(-)*	NIX pupil wheel
SEQ.CUBE.ST	no	F T *(F)*	Store Data Cube? (T/F)
SEQ.NEXPO	no	1..99 *(1)*	Number of exposures per offset position
SEQ.NIX.DET.WINDOWING	no	window1 window2 window3 window4 window5 windowF *(windowF)*	NIX Detector windowing Name
SEQ.NIX.DIT.LIST	no	0.0..1800.0 *(1 1)*	List of detector integration time
SEQ.NIX.NDIT.LIST	no	1..31775 *(1 1)*	List of number of detector integrations
SEQ.NOFF	no	1..1000 *(-)*	Number of offset positions
SEQ.OBSTYPE.LIST	no	O S *(-)*	List of observation types (O or S)
SEQ.OFFSET.COORDS	no	SKY DETECTOR *(-)*	Offset coordinate type selection
SEQ.OFFSET1.LIST	no	-800..800 *(-)*	List of offsets coordinates in RA or X
SEQ.OFFSET2.LIST	no	-800..800 *(-)*	List of offsets coordinates in DEC or Y
Fixed values:			
Parameter	Hidden	Value	Label
DPR.CATG	no	CALIB	Data product category
DPR.TECH	no	IMAGE	Data product technique
DPR.TYPE	no	STD	Data product type
SEQ.DO.PERSIST.ST	no	T	record persistence data? (T/F)
SEQ.EXT.FOCUS.CU	no	F	T focusOffset Val sent to CU; otherwise, sent to DSM
SEQ.MULTI.SHORT.EXP	no	T	T: multi short exposure, F: single long exposure
SEQ.NIX.FOCUS.POS	no	EXTERNAL	NXDF pos. EXTERNAL: for External Focus ; INTERNAL: for internal Focus; PUPILIMG: for Pupil_IMG
SEQ.NIX.SHUTTER.CLOSE.ST	no	T	at the End of Template, set NXIS=Dark1 (close NIX shutter)? (T/F)
SEQ.RETURN	no	T	Return to origin? (T/F)

4.2.6 ERIS_nixIMG_cal_TwFlats

This is the standard ESO routine to observe flats. Instead of using CU lamp, twilight is used for JHK band. The twilight flat field can be used in combination with an existing lamp flat field to calibrate the difference in detector illumination between the sky and CU lamp.

ERIS_nixIMG_cal_TwFlats.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
DET.READOUT	no	SLOW_GR_UTR FAST_UNCORR *(SLOW_GR_UTR)*	Detector readout mode
SEQ.CUBE.ST	no	F T *(F)*	Store Data Cube? (T/F)
SEQ.NEXPO	no	1..99 *(1)*	Number of exposures per DIT
SEQ.NIX.DET.WINDOWING	no	window1 window2 window3 window4 window5 windowF *(windowF)*	NIX Detector windowing Name
SEQ.NIX.DIT.LIST	no	0.0..1800.0 *(1 1)*	List of detector integration time
SEQ.NIX.NDIT.LIST	no	1..31775 *(1 1)*	List of number of detector integrations
SEQ.NIX.NXCW.LIST	no	13mas-JHK 27mas-JHK *(-)*	List of Camera wheel named positions
SEQ.NIX.NXFW.LIST	no	J H Ks Pa-b Fe-II H2-cont H2-1-0S Br-g K-peak IB-2.42 IB-2.48 *(-)*	List of filter wheel named positions
SEQ.NIX.NXPW.LIST	no	JHK-pupil Blocking *(-)*	List of pupil wheel named positions
Fixed values:			
Parameter	Hidden	Value	Label
DPR.CATG	no	CALIB	Data product category
DPR.TECH	no	IMAGE	Data product technique
DPR.TYPE	no	FLAT,TWILIGHT	Data product type
SEQ.DO.PERSIST.ST	no	T	record persistence data? (T/F)
SEQ.EXT.FOCUS.CU	no	F	T focusOffset Val sent to CU; otherwise, sent to DSM
SEQ.MULTI.SHORT.EXP	no	T	T: multi short exposure, F: single long exposure

SEQ.NIX.FOCUS.POS	no	EXTERNAL	NXDF pos. EXTERNAL: for External Focus ; INTERNAL: for internal Focus; PUPILIMG: for Pupil_IMG
SEQ.NIX.SHUTTER.CLOSE.ST	no	T	at the End of Template, set NXIS=Dark1 (close NIX shutter)? (T/F)
SEQ.RETURN	no	T	Return to origin? (T/F)

4.2.7 ERIS_nixLSS_cal_StandardStar

This template is similar to ERIS_nixLSS_obs_GenericOffset but for a standard star, necessary to ensure correct header keywords.

ERIS_nixLSS_cal_StandardStar.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
DET.READOUT	no	SLOW_GR_UTR FAST_UNCORR *(SLOW_GR_UTR)*	Detector readout mode
SEQ.CUBE.ST	no	F T *(F)*	Store Data Cube? (T/F)
SEQ.NEXPO	no	1..99 *(1)*	Number of exposures per offset position
SEQ.NIX.DET.WINDOWING	no	window1 window2 window3 window4 window5 windowF *(windowF)*	NIX Detector windowing Name
SEQ.NIX.DIT.LIST	no	0.0..1800.0 *(1 1)*	List of detector integration time
SEQ.NIX.NDIT.LIST	no	1..31775 *(1 1)*	List of number of detector integrations
SEQ.NOFF	no	1..1000 *(-)*	Number of offset positions
SEQ.OBSTYPE.LIST	no	O S *(-)*	List of observation types (O or S)
SEQ.OFFSET1.LIST	no	-800..800 *(-)*	List of offsets coordinates parallel to the slit
SEQ.OFFSET2.LIST	no	-800..800 *(-)*	List of offsets coordinates perpendicular to the slit
Fixed values:			
Parameter	Hidden	Value	Label
DPR.CATG	no	CALIB	Data product category
DPR.TECH	no	SPECTRUM,LSS	Data product technique
DPR.TYPE	no	STD	Data product type
INS.NXAW.NAME	no	Slit	NIX aperture wheel, need to match NXCW, NIX.OPTI2
INS.NXCW.NAME	no	13mas-LSS	NIX camera wheel
INS.NXFW.NAME	no	L-Broad	NIX filter wheel
INS.NXPW.NAME	no	Grism	NIX pupil wheel
SEQ.DO.PERSIST.ST	no	T	record persistence data? (T/F)
SEQ.EXT.FOCUS.CU	no	F	T focusOffset Val sent to CU; otherwise, sent to DSM
SEQ.MULTI.SHORT.EXP	no	T	T: multi short exposure, F: single long exposure
SEQ.NIX.FOCUS.POS	no	EXTERNAL	NXDF pos. EXTERNAL: for External Focus ; INTERNAL: for internal Focus; PUPILIMG: for Pupil_IMG
SEQ.NIX.SHUTTER.CLOSE.ST	no	T	at the End of Template, set NXIS=Dark1 (close NIX shutter)? (T/F)
SEQ.NIX.SLITTILT	no	1.95	NIX Slit Tilted angle in degree
SEQ.OFFSET.COORDS	no	SKY	Offset coordinate type selection
SEQ.RETURN	no	T	Return to origin? (T/F)

5 ERIS Technical Templates

5.1 IFS (SPIFFIER) Templates

5.1.1 ERIS_ifs_tec_BabySteps

This template is used to obtain super-sampled line profiles. The user selects a delta encoder step value and a number of steps to do positive and negative from the central wavelength value (total steps is 2*Nsteps + 1, steps scan from -delta*nsteps to +delta*nsteps). The template takes an arc-lamp calibration frame at each step position (alternatively, this can be done on-sky to get super-sampled sky lines). The data can be analyzed offline to obtain super-sampled line profiles.

ERIS_ifs_tec_BabySteps.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
DET.DIT	no	0..3600 *(-)*	Detector integration time
DET.NDIT	no	1..100 *(-)*	Number of detector integrations
INS.ARGON.ST	no	T F *(F)*	Argon lamp status
INS.BAND.NAME	no	J_low J_short J_middle J_long H_low H_short H_middle H_long K_low K_short K_middle K_long *(-)*	SPIFFIER grating

INS.KRIPTON.ST	no	T F *(F)*	Krypton lamp status
INS.NEON.ST	no	T F *(F)*	Neon lamp status
INS.SPGW.ENC	no	-1000..200000 *(-1000)*	Grating wheel encoder position
INS.SPXW.NAME	no	25mas 100mas 250mas *(-)*	SPIFFIER spaxel size
INS.XENON.ST	no	T F *(F)*	Xenon lamp status
SEQ.DELTA	no	0..10000 *(10)*	Delta encoder steps
SEQ.NEXPO	no	1..99 *(1)*	Number of exposures per offset position
SEQ.NSTEPS	no	1..1000 *(1)*	Number of steps positive and negative (total is 2*NSTEPS + 1)
SEQ.PERS.DATA	no	T F *(T)*	Record persistence data? (T/F)
Fixed values:			
Parameter	Hidden	Value	Label
DPR.CATG	no	CALIB	Data product category
DPR.TECH	no	IFU	Data product technique
DPR.TYPE	no	BABYSTEP	Data product type

5.1.2 ERIS_ifs_tec_CheckInternalFocus

This template is used for checking the focus of the SPIFFIER detector with respect to the image slicer.

First a number of dark images are taken followed by two exposures at nominal grating position and nominal filter position ± SEQ.FENCOFFSET. Then for each element of the SEQ.GENCOFFSET.LIST four images are taken: nominal grating position ± actual SEQ.GENCOFFSET and nominal filter position ± SEQ.FENCOFFSET. The SEQ.GENCOFFSET.LIST can be empty.

These images are analyzed offline to determine the defocus of the detector via a shift in the arc-lamp lines between the two pupil illuminations

ERIS_ifs_tec_CheckInternalFocus.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
DET.DIT	no	0..3600 *(-)*	Detector integration time
DET.NDIT	no	1..100 *(-)*	Number of detector integrations
INS.ARGON.ST	no	T F *(F)*	Argon lamp status
INS.BAND.NAME	no	J_low J_short J_middle J_long H_low H_short H_middle H_long K_low K_short K_middle K_long *(-)*	SPIFFIER grating
INS.KRIPTON.ST	no	T F *(F)*	Krypton lamp status
INS.NEON.ST	no	T F *(F)*	Neon lamp status
INS.SPXW.NAME	no	25mas 100mas 250mas *(-)*	SPIFFIER spaxel size
INS.XENON.ST	no	T F *(F)*	Xenon lamp status
SEQ.FENCOFFSET	no	*(1000)*	Encoder value to offset filter wheel(+/-)
SEQ.GENCOFFSET.LIST	no	*()*	List of grating encoder offsets
Fixed values:			
Parameter	Hidden	Value	Label
DPR.CATG	no	TECHNICAL	Data product category
DPR.TECH	no	IFU	Data product technique
DPR.TYPE	no	FLEXURE	Data product type

5.1.3 ERIS_ifs_tec_CheckPupil

Take a pupil image in the "J_low" band with the LDLS turned on.

In addition to the standard exposure file the reconstructed image is stored in "*/tmp/ermseqSpiffierCheckPupil.fits*".

ERIS_ifs_tec_CheckPupil.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
DET.DIT	no	0..3600 *(1.)*	Detector integration time
INS.BAND.NAME	no	J_low J_short J_middle J_long H_low H_short H_middle H_long K_low K_short K_middle K_long *(J_low)*	SPIFFIER grating
INS.IBSM.NAME	no	CALUNIT TELBEAM *(CALUNIT)*	CU selector mirror
SEQ.PERS.DATA	no	T F *(T)*	Record persistence data? (T/F)
Fixed values:			
Parameter	Hidden	Value	Label
DPR.CATG	no	CALIB	Data product category
DPR.TECH	no	IFU	Data product technique
DPR.TYPE	no	PUPIL,LAMP	Data product type

5.1.4 ERIS_ifs_tec_EastWest

This templates rotates the calibration slit mask from PHMR.START to PHMR.END with a step size of PHMR.STEPSIZE. For every step an exposure is taken. The data is analyzed offline to determine the exact East-West direction (parallel to the slitlet).

ERIS_ifs_tec_EastWest.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
INS.BAND.LIST	no	J_short J_middle J_long H_short H_middle H_long K_short K_middle K_long J_low H_low K_low *(J_short J_middle J_long H_short H_middle H_long K_short K_middle K_long J_low H_low K_low)*	List of SPIFFIER bands to be processed
INS.PHMR.END	no	40..100 *(51.5)*	End value for PHMR loop
INS.PHMR.START	no	40..100 *(50.)*	Start value for PHMR loop
INS.PHMR.STEPSIZE	no	0.001..10 *(0.2)*	Step size value for PHMR loop
INS.SCALE.LIST	no	25mas 100mas 250mas *(25mas 25mas 25mas 25mas 25mas 25mas 25mas 25mas 25mas 25mas 25mas)*	List of SPIFFIER scales to be processed
Fixed values:			
Parameter	Hidden	Value	Label
DPR.CATG	no	CALIB	Data product category
DPR.TECH	no	IFU	Data product technique
DPR.TYPE	no	EW	Data product type

5.1.5 ERIS_ifs_tec_FibreFocus

Compute the fibre home position along the z-axis. Place the instrument in the calibration position and acquire the fibre or slit mask. Then acquire for all requested bands exposures with the PHMZ focus set from PHMZ.START to PHMZ.START with the step size PHMZ.STEPSIZE. The pixel scale is set to 25 mas.

ERIS_ifs_tec_FibreFocus.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
DET.DIT	no	0..3600 *(-)*	Detector integration time
INS.BAND.LIST	no	J_short J_middle J_long H_short H_middle H_long K_short K_middle K_long J_low H_low K_low *(J_short J_middle J_long H_short H_middle H_long K_short K_middle K_long H_low K_low J_low)*	List of SPIFFIER bands to be processed
INS.FSSL	no	point slit *(point)*	Fiber switchyard selection
INS.PHMZ.END	no	40..100 *(82.51)*	End value for PHMZ loop
INS.PHMZ.START	no	40..100 *(78.5)*	Start value for PHMZ loop
INS.PHMZ.STEPSIZE	no	0.001..10 *(0.2)*	Step size value for PHMZ loop
Fixed values:			
Parameter	Hidden	Value	Label
DPR.CATG	no	TECHNICAL	Data product category
DPR.TECH	no	IFU	Data product technique
DPR.TYPE	no	FOCUS,FIBRE	Data product type

5.1.6 ERIS_ifs_tec_FreeSetup

Configures all IFS devices.

ERIS_ifs_tec_FreeSetup.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
INS.ADC1.MODE	no	AUTO OFF *()*	ADC1 tracking mode
INS.ADC1.POSANG	no	0..360 *()*	ADC1 position
INS.ADC2.MODE	no	AUTO OFF *()*	ADC2 tracking mode
INS.ADC2.POSANG	no	0..360 *()*	ADC2 position
INS.AO.NAME	no	NGS_ONAXIS_CU LO_ONAXIS_CU LGS_ONAXIS_CU SAFE NGS_OPEN LGS_OPEN NGS_SKY SE_SKY LGS_SKY *()*	AO configuration

INS.AOTRACK.NAME	no	NGS_TEC NGS_TEC_45 LGS_TEC LGS_TEC_45 SE_TEC SE_TEC_45 NGS_SKY LGS_SKY SE_SKY *()*	AO tracking
INS.CAL.NAME	no	OFF PPL FPN_EXT FPL_EXT FPN_DLNIR FPL_DLNIR *()*	CU configuration
INS.FSSL.NAME	no	MMIS MMSL MMPH SMVIS SMNIR *()*	FSSL configuration
INS.IBSM.NAME	no	CALUNIT TELBEAM *()*	CU selector mirror
INS.ISSM.NAME	no	IN OUT *()*	ISSM position
INS.LAMPS.NAME	no	OFF LDLS_ON QTH_ON NEON_ON ARGO_ON XENO_ON KRIP_ON LDLS_MAG8 LDLS_MAG9 LDLS_MAG10 LDLS_MAG12 LDLS_MAG14 LDLS_MAG16 LDLS_MAG20 *()*	Lamps configuration
INS.LGPM.X	no	0..10000 *()*	LGS pupil mirror X position
INS.LGPM.Y	no	0..10000 *()*	LGS pupil mirror Y position
INS.LGRT.MODE	no	STAT SKY ELEV USER *()*	LGRT tracking mode
INS.LGRT.POSANG	no	0..360 *()*	LGRT position angle
INS.LGSF.MODE	no	STAT TRACK *()*	LGSF tracking mode
INS.LGSF.ZPOS	no	0.01..93.2 *()*	LGS focus stage
INS.MODE	no	IFS nix nixIMG nixAPP nixFPC nixLSS nixSAM *()*	ERIS Instrument Mode
INS.NDSL.NAME	no	Dmag0 Dmag1 Dmag2 Dmag3 Dmag4 Dmag5 Dmag6 Dmag7 Dmag8 Dmag9 Dmag10 Dmag11 Dmag12 *()*	NDSL configuration
INS.NGFP.CSYSTEM	no	-35.0..35.0 *()*	NGS field patrol
INS.NGFP.MODE	no	STAT POINT TRACK *()*	NGFP tracking mode
INS.NGFP.XPOS	no	-35.0..35.0 *()*	NGFP X position
INS.NGFP.YPOS	no	-35.0..35.0 *()*	NGFP X position
INS.NGFW.NAME	no	OPEN ND1 ND2 BLOCK *()*	NGS filter wheel
INS.NGIR.NAME	no	MIN_POS MAX_FOV HALF_POS MAX_POS SMALL MEDIUM LARGE *()*	NGS iris
INS.NGPM.X	no	0..10000 *()*	NGS pupil mirror X position
INS.NGPM.Y	no	0..10000 *()*	NGS pupil mirror Y position
INS.NGRT.MODE	no	STAT SKY ELEV USER *()*	NGRT tracking mode
INS.NGRT.POSANG	no	0..360 *()*	NGRT position
INS.NGSF.POS	no	0.01..20 *()*	NGS focus stage
INS.NGSW.NAME	no	LO HO *()*	NGS Lenslet switch
INS.NXAW.NAME	no	Crosshairs Pinholes Slit Small Dark1 Large Vortex-L Vortex-M *()*	NIX aperture wheel, need to match NXCW, NIX.OPTI2
INS.NXCW.NAME	no	13mas-JHK 27mas-JHK 13mas-LM 13mas-LSS *()*	NIX camera wheel
INS.NXDF.NAME	no	E-cam1-S E-cam2-S E-cam3-S E-cam1-D E-cam2-D E-cam3-D E-APP-JHK E-APP-LM E-Vortex E-LSS I-cam1-S I-cam2-S I-cam3-S I-cam1-D I-cam2-D I-cam3-D Pupil-K-S Pupil-K-D Pupil-L-S Pupil-L-D *()*	NIX detector focus
INS.NXFW.NAME	no	Open1 IB-2.48 IB-2.42 Br-a-cont Br-a Br-g L-Broad Mp Short-Lp Lp Dark1 J H Ks Pa-b Fe-II H2-cont H2-1-0S K-peak Dark2 *()*	NIX filter wheel
INS.NXIS.NAME	no	27mas-JHK Dark1 13mas-JHK 13mas-LM Dark2 Pupil 13mas-LSS APP-JHK APP-LM Vortex Dark3 *()*	NIX plate scale. Must match the camera wheel NXCW
INS.NXPW.NAME	no	Crosshairs Dark3 Dark4 Dark5 Open1 Lyot-ND ND Lyot Spider LM-pupil Dark1 JHK-pupil Blocking APP Grism SAM-7 SAM-9 SAM-23 Open Dark2 *()*	NIX pupil wheel
INS.PHMR.NAME	no	MIN_POS DLVIS DLNIR NGS05 NGS10 NGS15 LGS05 LGS10 LGS15 MAX_POS *()*	PHMR position
INS.PHMX.POS	no	1..22 *()*	PHMX position
INS.PHMY.POS	no	1..22 *()*	PHMY position
INS.PHMZ.NAME	no	FOC80KM INFINITY *()*	PHMZ position
INS.SCSM.NAME	no	NIX SPIFFIER *()*	Science selector mirror
INS.SHUT.ST	no	T F *()*	LGS shutter
INS.SPFW.NAME	no	Closed1 K_new 3D_K_1 H+K_new H+K_1 Closed2 J_short J_middle J_long J_new Closed3 H_short H_middle H_long H_middle_long H_new Closed4 Open *()*	Filter wheel position

INS.SPGW.NAME	no	J_low H_low K_low J_short J_middle J_long H_short H_middle H_long K_short K_middle K_long *()*	Grating wheel position
INS.SPXW.NAME	no	25mas 100mas 250mas *()*	SPIFFIER spaxel size
Fixed values:			
Parameter	Hidden	Value	Label

5.1.7 ERIS_ifs_tec_FunctionalTest

This template shall check some sensor readings for reasonable values and exercise all SPIFFIER motors.

If at least one of the sensor readings is out of range a dialog will be displayed showing the error condition(s). It is the user choice to abort the template or to continue with the motor tests. When a motor positioning fails the template will be aborted with an error.

ERIS_ifs_tec_FunctionalTest.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
SEQ.PERS.DATA	no	T F *(T)*	Record persistence data? (T/F)
Fixed values:			
Parameter	Hidden	Value	Label
DPR.CATG	no	TECHNICAL	Data product category
DPR.TECH	no	IMAGE	Data product technique
DPR.TYPE	no	GENERIC	Data product type

5.1.8 ERIS_ifs_tec_GainLinearity

This template takes a series of flat fields with exposure times listed in DET.DIT.LIST. Ideally these values in combination with the INS.LAMP5.VALUE should result in detector exposure levels ranging from 1000 counts up to saturation. The series of exposures is analyzed by the pipeline in order to determine the detector linearity characteristics. NOTE: This template can result in detector persistence, and thus should only be used when the instrument will not be doing calibrations or observations in the near (12-24 hours) future.

ERIS_ifs_tec_GainLinearity.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
DET.DIT.LIST	no	*(-)*	List of DITs
DET.NDIT	no	1..100 *(-)*	Number of detector integrations
INS.BAND.NAME	no	J_low J_short J_middle J_long H_low H_short H_middle H_long K_low K_short K_middle K_long *(-)*	SPIFFIER grating
INS.QTH.INTENS	no	0..100 *(50)*	Quartz halogen lamp intensity in percentage
INS.SPXW.NAME	no	25mas 100mas 250mas *(-)*	SPIFFIER spaxel size
SEQ.NEXPO	no	1..99 *(1)*	Number of exposures per offset position
Fixed values:			
Parameter	Hidden	Value	Label
DPR.CATG	no	CALIB	Data product category
DPR.TECH	no	IFU	Data product technique
DPR.TYPE	no	LINEARITY,LAMP,DETCHAR	Data product type

5.1.9 ERIS_ifs_tec_GenExposure

This template take one or SEQ.NEXPO exposures at a single SPIFFIER setting. The template starts and ends with a "closed" filter position. To define the filter position for the exposures at least one of INS.BAND.NAME or INS.SPFW.NAME or INS.SPFW.ENC must be specified. If no pre-optics wheel position is given the current position will be used. If no grating wheel position nor INS.BAND.NAME is given the current position will be used. Encoder positions will overwrite named positions. INS.BAND.NAME will overwrite filter and grating wheel settings.

ERIS_ifs_tec_GenExposure.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
DET.DIT	no	0..3600 *(-)*	Detector integration time
DET.NDIT	no	1..100 *(-)*	Number of detector integrations
INS.BAND.NAME	no	J_low J_short J_middle J_long H_low H_short H_middle H_long K_low K_short K_middle K_long *(-)*	SPIFFIER grating
INS.SPFW.ENC	no	-1000..200000 *(-1000)*	Filter wheel encoder position

INS.SPFW.NAME	no	Closed1 K_new 3D_K_1 H+K_new H+K_1 Closed2 J_short J_middle J_long J_new Closed3 H_short H_middle H_long H_middle_long H_new Closed4 Open *(-)*	Filter wheel position
INS.SPGW.ENC	no	-1000..200000 *(-1000)*	Grating wheel encoder position
INS.SPGW.NAME	no	J_low H_low K_low J_short J_middle J_long H_short H_middle H_long K_short K_middle K_long *(-)*	Grating wheel position
INS.SPXW.ENC	no	-1000..200000 *(-1000)*	Pre-optics wheel encoder position
INS.SPXW.NAME	no	25mas 100mas 250mas pupil *(-)*	SPIFFIER spaxel size
SEQ.NEXPO	no	1..99 *(1)*	Number of exposures per offset position
SEQ.PERS.DATA	no	T F *(T)*	Record persistence data? (T/F)
Fixed values:			
Parameter	Hidden	Value	Label
DPR.CATG	no	TECHNICAL	Data product category
DPR.TECH	no	IMAGE	Data product technique
DPR.TYPE	no	GENERIC	Data product type

5.1.10 ERIS_ifs_tec_NorthSouth

For each requested band and pixel scale following exposures are taken:

- Either a single slit mask in upright rotation exposure or a sequence of single fibre exposures with the fiber moved in upright direction. A corresponding dark exposure is taken as well.
- One or more pen pen ray lamp exposure with the corresponding dark images.
- A flat exposure with its corresponding dark image.

ERIS_ifs_tec_NorthSouth.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
INS.BAND.LIST	no	J_short J_middle J_long H_short H_middle H_long K_short K_middle K_long J_low H_low K_low *(J_short J_middle J_long H_short H_middle H_long K_short K_middle K_long H_low K_low J_low)*	List of SPIFFIER bands to be processed
INS.SCALE.LIST	no	25mas 100mas 250mas *(250mas)*	List of SPIFFIER pixel scales to be processed
SEQ.METHOD	no	slitMask pointSource *(slitMask)*	NorthSouth test method, either slitMask or pointSource
SEQ.PERS.DATA	no	T F *(T)*	Record persistence data? (T/F)
Fixed values:			
Parameter	Hidden	Value	Label
DPR.CATG	no	CALIB	Data product category
DPR.TECH	no	IFU	Data product technique
DPR.TYPE	no	NS	Data product type

5.1.11 ERIS_ifs_tec_QuickHealthChk

The template takes a single fibre image in a predefined instrument setup. It stores the reconstructed image in a file which is passed to a Python script to check the reconstructed image. If the Python script indicates a problem a template error condition will be triggered.

ERIS_ifs_tec_QuickHealthChk.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
SEQ.PERS.DATA	no	T F *(T)*	Record persistence data? (T/F)
SEQ.STOP_LAMPS	no	T F *(T)*	Switch LAMPS off after measurement
Fixed values:			
Parameter	Hidden	Value	Label
DPR.CATG	no	TECHNICAL	Data product category
DPR.TECH	no	IFU	Data product technique
DPR.TYPE	no	QUICKHEALTH	Data product type

5.2 Imaging (NIX) Templates

5.2.1 ERIS_nix_tec_CheckInternalFocus

This template is used to set the internal NIX detector focus for JHK and LM bands. It takes images of the NIX distortion mask and moves the NIX focus-stage position between images. This will work for all wavebands as we can use the calibration source for JHK and thermal emission through the distortion mask in LM. The exposure time will be a bit longer for the LM band case. The image data is then analysed to determine the best detector focus position.

ERIS_nix_tec_CheckInternalFocus.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
DET.DIT	no	0.0..1800 *(-)*	Detector integration time
DET.NDIT	no	1..31775 *(-)*	Number of detector integrations
DET.READOUT	no	SLOW_GR_UTR FAST_UNCORR *(SLOW_GR_UTR)*	Detector readout mode
INS.NXAW.NAME	no	Crosshairs Pinholes Slit Small Large Vortex-L Vortex-M *(-)*	NIX aperture wheel, need to match NXCW, NIX.OPTI2
INS.NXCW.NAME	no	13mas-JHK 27mas-JHK 13mas-LM *(-)*	NIX camera wheel
INS.NXFW.NAME	no	J H Ks Pa-b Fe-II H2-cont H2-1-0S Br-g K-peak IB-2.42 IB-2.48 Short-Lp Lp Mp Br-a-cont Br-a *(-)*	NIX filter wheel
INS.NXPW.NAME	no	JHK-pupil Blocking LM-pupil Spider ND *(-)*	NIX pupil wheel
INS.QTH.INTENS	no	0..100 *(50)*	Quartz halogen lamp intensity in percentage
SEQ.CUBE.ST	no	F T *(F)*	Store Data Cube? (T/F)
SEQ.NEXPO	no	1..99 *(1)*	Number of exposures per NXDF step
SEQ.NXDF.MINMAX.LIST	no	0.0..5.0 *(0.0 5.0)*	
SEQ.NXDF.STEP	no	0.0..0.2 *(-)*	
Fixed values:			
Parameter	Hidden	Value	Label
DPR.CATG	no	TECHNICAL	Data product category
DPR.TECH	no	IMAGE	Data product technique
DPR.TYPE	no	FOCUS,INTERNAL	Data product type
SEQ.DO.PERSIST.ST	no	T	record persistence data? (T/F)
SEQ.EXT.FOCUS.CU	no	T	T focusOffset Val sent to CU; otherwise, sent to DSM
SEQ.MULTI.SHORT.EXP	no	T	T: multi short exposure, F: single long exposure
SEQ.NIX.FOCUS.POS	no	INTERNAL	NXDF pos. EXTERNAL: for External Focus ; INTERNAL: for internal Focus; PUPILIMG: for Pupil_IMG

5.2.2 ERIS_nix_tec_CheckPupil

This template takes an image of the pupil to check that the spider mask in the NIX pupil wheel is lined up with the spider, and that the pupil is aligned with the instrument. Pupil image is analyzed offline by the pipeline.

ERIS_nix_tec_CheckPupil.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
DET.DIT	no	0.0..1800 *(-)*	Detector integration time
DET.NDIT	no	1..31775 *(-)*	Number of detector integrations
DET.READOUT	no	SLOW_GR_UTR FAST_UNCORR *(-)*	Detector readout mode
INS.NXCW.NAME	no	13mas-JHK 27mas-JHK 13mas-LM *(-)*	NIX camera wheel
INS.NXDF.NAME	no	E-cam1-S E-cam2-S E-cam3-S E-cam1-D E-cam2-D E-cam3-D E-APP-JHK E-APP-LM E-Vortex E-LSS I-cam1-S I-cam2-S I-cam3-S I-cam1-D I-cam2-D I-cam3-D Pupil-K-S Pupil-K-D Pupil-L-S Pupil-L-D *(-)*	NIX detector focus
INS.NXFW.NAME	no	J H Ks Pa-b Fe-II H2-cont H2-1-0S Br-g K-peak IB-2.42 IB-2.48 Short-Lp Lp Mp Br-a-cont Br-a *(-)*	NIX filter wheel
SEQ.AO.FOFFSET	no	EXTFOFF_1S EXTFOFF_1D EXTFOFF_2S EXTFOFF_2D EXTFOFF_3S EXTFOFF_3D *(-)*	AO Focus Offset
SEQ.CUBE.ST	no	F T *(F)*	Store Data Cube? (T/F)
SEQ.EXT.FOCUS.CU	no	F T *(T)*	Image pupil of Cal unit (True) or the telescope (False)

SEQ.NEXPO	no	1..99 *(1)*	Number of exposures per DIT
SEQ.NIX.NXPW.LIST	no	Crosshairs Dark3 Dark4 Dark5 Open1 Lyot-ND ND Lyot Spider LM-pupil Dark1 JHK-pupil Blocking APP Grism SAM-7 SAM-9 SAM-23 Open Dark2 *(Open1)*	List of pupil wheel named positions
SEQ.NIX.SHUTTER.CLOSE.ST	no	F T *(T)*	at the End of Template, set NXIS=Dark1 (close NIX shutter)? (T/F)
SEQ.STOP_LAMPS	no	T F *(T)*	Switch LAMPS off after measurement
TEL.ROT.OFFANGLE	no	*(0.)*	Position Angle on Sky
Fixed values:			
Parameter	Hidden	Value	Label
DPR.CATG	no	CALIB	Data product category
DPR.TECH	no	IMAGE	Data product technique
DPR.TYPE	no	PUPIL,LAMP	Data product type
SEQ.DO.PERSIST.ST	no	T	record persistence data? (T/F)
SEQ.MULTI.SHORT.EXP	no	T	T: multi short exposure, F: single long exposure
SEQ.NIX.FOCUS.POS	no	EXTERNAL	NXDF pos. EXTERNAL: for External Focus ; INTERNAL: for internal Focus; PUPILIMG: for Pupil_IMG

5.2.3 ERIS_nix_tec_FibreFocus

This template is used to align the entire NIX to ERIS using the calibration unit. NIX has built-in mechanical mechanism. By adjusting its mount, NIX's position can be turned mechanically to best focus. A set of images are taken while CU's fiber stage mechanism is moved through its nominal focus position sequentially. The image data is then analysed to determine the best focus position. The analysis is used to determine how much to move NIX so the best focus is achieved with the CU fibre in its nominal position. A few iterations may be needed to achieve it. In NIX case the CU fibre position is guaranteed to be the same as the nominal fibre position achieved when the CU and AO systems were aligned.

ERIS_nix_tec_FibreFocus.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
DET.DIT	no	0.0..1800.0 *(0.5)*	Detector integration time
DET.NDIT	no	1..31775 *(-)*	Number of detector integrations
DET.READOUT	no	SLOW_GR_UTR FAST_UNCORR *(-)*	Detector readout mode
INS.NXCW.NAME	no	13mas-JHK 27mas-JHK 13mas-LM *(13mas-JHK)*	NIX camera wheel
INS.NXFW.NAME	no	J H Ks Pa-b Fe-II H2-cont H2-1-0S Br-g K-peak IB-2.42 IB-2.48 Short-Lp Lp Mp Br-a-cont Br-a *(Br-g)*	NIX filter wheel
INS.NXPW.NAME	no	JHK-pupil Blocking LM-pupil Spider ND *(-)*	NIX pupil wheel
INS.PHMX.POS	no	1..22 *(11)*	PHMX position
INS.PHMY.POS	no	1..22 *(11)*	PHMY position
SEQ.CUBE.ST	no	F T *(F)*	Store Data Cube? (T/F)
SEQ.NEXPO	no	1..99 *(1)*	Number of exposures per PHMZ Position
SEQ.PHMZ.MINMAX.LIST	no	1.0..101.9 *(78.0 83.1)*	
SEQ.PHMZ.STEP	no	0.0..3.0 *(0.2)*	
Fixed values:			
Parameter	Hidden	Value	Label
DPR.CATG	no	TECHNICAL	Data product category
DPR.TECH	no	IMAGE	Data product technique
DPR.TYPE	no	FOCUS,FIBRE	Data product type
SEQ.DO.PERSIST.ST	no	T	record persistence data? (T/F)
SEQ.EXT.FOCUS.CU	no	T	T focusOffset Val sent to CU; otherwise, sent to DSM
SEQ.MULTI.SHORT.EXP	no	T	T: multi short exposure, F: single long exposure
SEQ.NIX.FOCUS.POS	no	EXTERNAL	NXDF pos. EXTERNAL: for External Focus ; INTERNAL: for internal Focus; PUPILIMG: for Pupil_IMG

5.2.4 ERIS_nix_tec_FreeSetup

Configures all NIX devices.

ERIS_nix_tec_FreeSetup.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
INS.ADC1.MODE	no	AUTO OFF *()*	ADC1 tracking mode
INS.ADC1.POSANG	no	0..360 *()*	ADC1 position
INS.ADC2.MODE	no	AUTO OFF *()*	ADC2 tracking mode
INS.ADC2.POSANG	no	0..360 *()*	ADC2 position

INS.AO.NAME	no	NGS_ONAXIS_CU LO_ONAXIS_CU LGS_ONAXIS_CU SAFE NGS_OPEN LGS_OPEN NGS_SKY SE_SKY LGS_SKY *()*	AO configuration
INS.AOTRACK.NAME	no	NGS_TEC NGS_TEC_45 LGS_TEC LGS_TEC_45 SE_TEC SE_TEC_45 NGS_SKY LGS_SKY SE_SKY *()*	AO tracking
INS.CAL.NAME	no	OFF PPL FPN_EXT FPL_EXT FPN_DLNIR FPL_DLNIR *()*	CU configuration
INS.FSSL.NAME	no	MMIS MMSL MMPH SMVIS SMNIR *()*	FSSL configuration
INS.IBSM.NAME	no	CALUNIT TELBEAM *()*	CU selector mirror
INS.ISSM.NAME	no	IN OUT *()*	ISSM position
INS.LAMPS.NAME	no	OFF LDLS_ON QTH_ON NEON_ON ARGO_ON XENO_ON KRIP_ON LDLS_MAG8 LDLS_MAG9 LDLS_MAG10 LDLS_MAG12 LDLS_MAG14 LDLS_MAG16 LDLS_MAG20 *()*	Lamps configuration
INS.LGPM.X	no	0..10000 *()*	LGS pupil mirror X position
INS.LGPM.Y	no	0..10000 *()*	LGS pupil mirror Y position
INS.LGRT.MODE	no	STAT SKY ELEV USER *()*	LGRT tracking mode
INS.LGRT.POSANG	no	0..360 *()*	LGRT position angle
INS.LGSF.MODE	no	STAT TRACK *()*	LGSF tracking mode
INS.LGSF.ZPOS	no	0.01..93.2 *()*	LGS focus stage
INS.MODE	no	IFS nix nixIMG nixAPP nixFPC nixLSS nixSAM *()*	ERIS Instrument Mode
INS.NDSL.NAME	no	Dmag0 Dmag1 Dmag2 Dmag3 Dmag4 Dmag5 Dmag6 Dmag7 Dmag8 Dmag9 Dmag10 Dmag11 Dmag12 *()*	NDSL configuration
INS.NGFP.CSYSTEM	no	-35.0..35.0 *()*	NGS field patrol
INS.NGFP.MODE	no	STAT POINT TRACK *()*	NGFP tracking mode
INS.NGFP.XPOS	no	-35.0..35.0 *()*	NGFP X position
INS.NGFP.YPOS	no	-35.0..35.0 *()*	NGFP X position
INS.NGFW.NAME	no	OPEN ND1 ND2 BLOCK *()*	NGS filter wheel
INS.NGIR.NAME	no	MIN_POS MAX_FOV HALF_POS MAX_POS SMALL MEDIUM LARGE *()*	NGS iris
INS.NGPM.X	no	0..10000 *()*	NGS pupil mirror X position
INS.NGPM.Y	no	0..10000 *()*	NGS pupil mirror Y position
INS.NGRT.MODE	no	STAT SKY ELEV USER *()*	NGRT tracking mode
INS.NGRT.POSANG	no	0..360 *()*	NGRT position
INS.NGSF.POS	no	0.01..20 *()*	NGS focus stage
INS.NGSW.NAME	no	LO HO *()*	NGS Lenslet switch
INS.NXAW.NAME	no	Crosshairs Pinholes Slit Small Dark1 Large Vortex-L Vortex-M *()*	NIX aperture wheel, need to match NXCW, NIX.OPTI2
INS.NXCW.NAME	no	13mas-JHK 27mas-JHK 13mas-LM 13mas-LSS *()*	NIX camera wheel
INS.NXDF.NAME	no	E-cam1-S E-cam2-S E-cam3-S E-cam1-D E-cam2-D E-cam3-D E-APP-JHK E-APP-LM E-Vortex E-LSS I-cam1-S I-cam2-S I-cam3-S I-cam1-D I-cam2-D I-cam3-D Pupil-K-S Pupil-K-D Pupil-L-S Pupil-L-D *()*	NIX detector focus
INS.NXFW.NAME	no	Open1 IB-2.48 IB-2.42 Br-a-cont Br-a Br-g L-Broad Mp Short-Lp Lp Dark1 J H Ks Pa-b Fe-II H2-cont H2-1-0S K-peak Dark2 *()*	NIX filter wheel
INS.NXIS.NAME	no	27mas-JHK Dark1 13mas-JHK 13mas-LM Dark2 Pupil 13mas-LSS APP-JHK APP-LM Vortex Dark3 *()*	NIX plate scale. Must match the camera wheel NXCW
INS.NXPW.NAME	no	Crosshairs Dark3 Dark4 Dark5 Open1 Lyot-ND ND Lyot Spider LM-pupil Dark1 JHK-pupil Blocking APP Grism SAM-7 SAM-9 SAM-23 Open Dark2 *()*	NIX pupil wheel
INS.PHMR.NAME	no	MIN_POS DLVIS DLNIR NGS05 NGS10 NGS15 LGS05 LGS10 LGS15 MAX_POS *()*	PHMR position
INS.PHMX.POS	no	1..22 *()*	PHMX position
INS.PHMY.POS	no	1..22 *()*	PHMY position
INS.PHMZ.NAME	no	FOC80KM INFINITY *()*	PHMZ position
INS.SCSM.NAME	no	NIX SPIFFIER *()*	Science selector mirror
INS.SHUT.ST	no	T F *()*	LGS shutter

INS.SPFW.NAME	no	Closed1 K_new 3D_K_1 H+K_new H+K_1 Closed2 J_short J_middle J_long J_new Closed3 H_short H_middle H_long H_middle_long H_new Closed4 Open *()*	Filter wheel position
INS.SPGW.NAME	no	J_low H_low K_low J_short J_middle J_long H_short H_middle H_long K_short K_middle K_long *()*	Grating wheel position
INS.SPXW.NAME	no	25mas 100mas 250mas *()*	SPIFFIER spaxel size
SEQ.AO.MODE	no	ERIS_NGS ERIS_LGS *()*	AO mode
Fixed values:			
Parameter	Hidden	Value	Label

5.2.5 ERIS_nix_tec_FunctionalTest

This is used to perform a thorough test of all sub-subsystem functions in (possibly) all configurations (e.g. all filter positions, all detector readout modes). It is meant to be used occasionally, e.g. after dismounting/remounting of the instrument or sub-system. It can take some time to complete (several minutes to 1 hr).

ERIS_nix_tec_FunctionalTest.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
Fixed values:			
Parameter	Hidden	Value	Label
SEQ.NIX.NXAW.LIST	no	Crosshairs Pinholes Slit Small Large Vortex-L Vortex-M Dark1	List of aperture wheel name position
SEQ.NIX.NXCW.LIST	no	27mas-JHK 13mas-JHK 13mas-LM 13mas-LSS 13mas-JHK	List of Camera wheel named positions
SEQ.NIX.NXDF.LIST	no	E-cam1-D I-cam2-D I-cam3-S Pupil-L-D Pupil-L-S I-cam3-D E-cam1-S E-cam2-S E-cam3-S Pupil-K-S I-cam2-S I-cam1-S I-cam2-S I-cam1-D Pupil-K-D E-Vortex E-APP-LM E-APP-JHK E-cam3-D E-cam2-D	List of detector focusStage position
SEQ.NIX.NXFW.LIST	no	Open1 IB-2.48 IB-2.42 Br-a-cont Br-a Br-g L-Broad Mp Short-Lp Lp J H Ks Pa-b Fe-II H2-cont H2-1-0S K-peak Dark2 Dark1	List of filter wheel named positions
SEQ.NIX.NXIS.LIST	no	13mas-JHK 27mas-JHK 13mas-LM 13mas-LSS Pupil APP-JHK APP-LM Vortex Dark2 Dark3 Dark1	List of imageSelect position
SEQ.NIX.NXPW.LIST	no	Crosshairs Dark3 Dark4 Dark5 Open1 Lyot-ND ND Lyot Spider LM-pupil JHK-pupil Blocking APP Grism SAM-7 SAM-9 SAM-23 Open2 Dark2 Dark1	List of pupil wheel named positions

5.2.6 ERIS_nix_tec_GainLinearity

This template computes the detector gain (e-/ADU) and it is used to map the linearity of the detector through its full range of flux. The template will take a series of lamp-on/lamp-off pairs with the same exposure time (NDIT*DIT) and illumination with DIT progressing from the minimum allowed to saturation. Roughly 20 lamp flats are needed. It is similar to ERIS_nixIMG_cal_LampFlats but with specific DIT range.

ERIS_nix_tec_GainLinearity.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
DET.READOUT	no	SLOW_GR_UTR FAST_UNCORR *(SLOW_GR_UTR)*	Detector readout mode
INS.NXFW.NAME	no	J H Ks Pa-b Fe-II H2-cont H2-1-0S Br-g K-peak IB-2.42 IB-2.48 *(-)*	NIX filter wheel
INS.NXPW.NAME	no	JHK-pupil Blocking *(-)*	NIX pupil wheel
INS.QTH.INTENS	no	0..100 *(50)*	Quartz halogen lamp intensity in percentage
SEQ.CUBE.ST	no	F T *(F)*	Store Data Cube? (T/F)
SEQ.NEXPO	no	1..99 *(1)*	Number of exposures per DIT
SEQ.NIX.DIT.LIST	no	0.0..1800.0 *(1 1)*	List of detector integration time
SEQ.NIX.NDIT.LIST	no	1..31775 *(1 1)*	List of number of detector integrations
Fixed values:			

Parameter	Hidden	Value	Label
DPR.CATG	no	CALIB	Data product category
DPR.TECH	no	IMAGE	Data product technique
DPR.TYPE	no	LINEARITY,LAMP,DETCHAR	Data product type
INS.NXAW.NAME	no	Large	NIX aperture wheel, need to match NXCW, NIX.OPTI2
INS.NXCW.NAME	no	13mas-JHK	NIX camera wheel
SEQ.AO.FOFFSET	no	EXTFOFF_1S	AO Focus Offset
SEQ.DO.PERSIST.ST	no	T	record persistence data? (T/F)
SEQ.EXT.FOCUS.CU	no	T	T focusOffset Val sent to CU; otherwise, sent to DSM
SEQ.MULTI.SHORT.EXP	no	T	T: multi short exposure, F: single long exposure
SEQ.NIX.FOCUS.POS	no	EXTERNAL	NXDF pos. EXTERNAL: for External Focus ; INTERNAL: for internal Focus; PUPILIMG: for Pupil_IMG
SEQ.NIX.SHUTTER.CLOSE.ST	no	T	at the End of Template, set NXIS=Dark1 (close NIX shutter)? (T/F)

5.2.7 ERIS_nix_tec_GenExposure

This template takes SEQ.NEXPO exposures with all NIX mechanism setup by the user.

ERIS_nix_tec_GenExposure.tsf

To be specified:

Parameter	Hidden	Range *(Default)*	Label
DET.DIT	no	0.0..1800 *(0.1)*	Detector integration time
DET.NDIT	no	1..31775 *(3)*	Number of detector integrations
DET.READOUT	no	SLOW_GR_UTR FAST_UNCORR *(FAST_UNCORR)*	Detector readout mode
INS.NXAW.NAME	no	Crosshairs Pinholes Slit Small Dark1 Large Vortex-L Vortex-M *(-)*	NIX aperture wheel, need to match NXCW, NIX.OPTI2
INS.NXCW.NAME	no	13mas-JHK 27mas-JHK 13mas-LM 13mas-LSS *(-)*	NIX camera wheel
INS.NXDF.NAME	no	E-cam1-S E-cam2-S E-cam3-S E-cam1-D E-cam2-D E-cam3-D E-APP-JHK E-APP-LM E-Vortex E-LSS I-cam1-S I-cam2-S I-cam3-S I-cam1-D I-cam2-D I-cam3-D Pupil-K-S Pupil-K-D Pupil-L-S Pupil-L-D *(-)*	NIX detector focus
INS.NXFW.NAME	no	Open1 IB-2.48 IB-2.42 Br-a-cont Br-a Br-g L-Broad Mp Short-Lp Lp Dark1 J H Ks Pa-b Fe-II H2-cont H2-1-0S K-peak Dark2 *(-)*	NIX filter wheel
INS.NXIS.NAME	no	27mas-JHK Dark1 13mas-JHK 13mas-LM Dark2 Pupil 13mas-LSS APP-JHK APP-LM Vortex Dark3 *(-)*	NIX plate scale. Must match the camera wheel NXCW
INS.NXPW.NAME	no	Crosshairs Dark3 Dark4 Dark5 Open1 Lyot-ND ND Lyot Spider LM-pupil Dark1 JHK-pupil Blocking APP Grism SAM-7 SAM-9 SAM-23 Open Dark2 *(-)*	NIX pupil wheel
SEQ.CUBE.ST	no	F T *(F)*	Store Data Cube? (T/F)
SEQ.NEXPO	no	1..99 *(1)*	Number of exposures
SEQ.NIX.DET.WINDOWING	no	window1 window2 window3 window4 window5 windowF *(windowF)*	NIX Detector windowing Name

Fixed values:

Parameter	Hidden	Value	Label
DPR.CATG	no	TECHNICAL	Data product category
DPR.TECH	no	IMAGE	Data product technique
DPR.TYPE	no	GENERIC	Data product type
SEQ.CHKAO.FOFFSET.ST	no	F	T: at the beginning, check AO focus offset, display; F: do nothing
SEQ.DO.PERSIST.ST	no	T	record persistence data? (T/F)
SEQ.EXT.FOCUS.CU	no	T	T focusOffset Val sent to CU; otherwise, sent to DSM
SEQ.MULTI.SHORT.EXP	no	T	T: multi short exposure, F: single long exposure
SEQ.NIX.FOCUS.POS	no	INTERNAL	NXDF pos. EXTERNAL: for External Focus ; INTERNAL: for internal Focus; PUPILIMG: for Pupil_IMG
SEQ.NIX.SHUTTER.CLOSE.ST	no	T	at the End of Template, set NXIS=Dark1 (close NIX shutter)? (T/F)

5.2.8 ERIS_nix_tec_MeasureVibes

This template is used to monitor the vibrations by taking exposures of the target in 'cube' mode. For a bright target, the high time resolution of the cube data would let us see if the image is moving around on the detector.

ERIS_nix_tec_MeasureVibes.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
DET.DIT	no	0.0..1800 *(-)*	Detector integration time
DET.NDIT	no	1..31775 *(-)*	Number of detector integrations
DET.READOUT	no	SLOW_GR_UTR FAST_UNCORR *(-)*	Detector readout mode
INS.NXCW.NAME	no	13mas-JHK 27mas-JHK *(-)*	NIX camera wheel
INS.NXFW.NAME	no	J H Ks Pa-b Fe-II H2-cont H2-1-0S Br-g K-peak IB-2.42 IB-2.48 *(-)*	NIX filter wheel
INS.NXPW.NAME	no	JHK-pupil Blocking *(-)*	NIX pupil wheel
INS.PHMX.POS	no	1..22 *(11)*	PHMX position
INS.PHMY.POS	no	1..22 *(11)*	PHMY position
SEQ.NEXPO	no	1..99 *(1)*	Number of exposures per DIT
SEQ.NIX.DET.WINDOWING	no	window1 window2 window3 window4 window5 windowF *(windowF)*	NIX Detector windowing Name
Fixed values:			
Parameter	Hidden	Value	Label
DPR.CATG	no	TECHNICAL	Data product category
DPR.TECH	no	IMAGE	Data product technique
DPR.TYPE	no	VIBRATION	Data product type
SEQ.CUBE.ST	no	T	Store Data Cube? (T/F)
SEQ.DO.PERSIST.ST	no	T	record persistence data? (T/F)
SEQ.EXT.FOCUS.CU	no	T	T focusOffset Val sent to CU; otherwise, sent to DSM
SEQ.MULTI.SHORT.EXP	no	T	T: multi short exposure, F: single long exposure
SEQ.NIX.FOCUS.POS	no	EXTERNAL	NXDF pos. EXTERNAL: for External Focus ; INTERNAL: for internal Focus; PUPILIMG: for Pupil_IMG

5.2.9 ERIS_nix_tec_QuickHealthChk

This template is used to perform a basic check on a subset of the sub-system functions (e.g. verifies that one filter can be set, one image acquired). It is meant to be performed daily, e.g. before starting operations. It shouldn't take much time to complete (several minutes).

ERIS_nix_tec_QuickHealthChk.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
DET.DIT	no	0.0..1800 *(6)*	Detector integration time
DET.NDIT	no	1..31775 *(3)*	Number of detector integrations
DET.READOUT	no	SLOW_GR_UTR FAST_UNCORR *(SLOW_GR_UTR)*	Detector readout mode
INS.QTH.INTENS	no	0..100 *(15)*	Quartz halogen lamp intensity in percentage
SEQ.AO.FOFFSET	no	EXTFOFF_1S EXTFOFF_1D EXTFOFF_2S EXTFOFF_2D EXTFOFF_3S EXTFOFF_3D *(EXTFOFF_1S)*	AO Focus Offset
SEQ.CUBE.ST	no	F T *(F)*	Store Data Cube? (T/F)
SEQ.NEXPO	no	1..99 *(1)*	Number of exposures per offset position
Fixed values:			
Parameter	Hidden	Value	Label
DPR.CATG	no	TECHNICAL	Data product category
DPR.TECH	no	IMAGE	Data product technique
DPR.TYPE	no	QUICKHEALTH	Data product type
SEQ.DO.PERSIST.ST	no	T	record persistence data? (T/F)
SEQ.EXT.FOCUS.CU	no	T	T focusOffset Val sent to CU; otherwise, sent to DSM
SEQ.MULTI.SHORT.EXP	no	T	T: multi short exposure, F: single long exposure
SEQ.NIX.FOCUS.POS	no	EXTERNAL	NXDF pos. EXTERNAL: for External Focus ; INTERNAL: for internal Focus; PUPILIMG: for Pupil_IMG
SEQ.NIX.SHUTTER.CLOSE.ST	no	T	at the End of Template, set NXIS=Dark1 (close NIX shutter)? (T/F)

5.2.10 ERIS_nix_tec_Test

To be written.

ERIS_nix_tec_Test.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
SEQ.OFFSET.COORDS	no	SKY DETECTOR *(SKY)*	Offset coordinate type selection
SEQ.OFFSET1.LIST	no	-800..800 *(-)*	List of offsets coordinates in RA or X
SEQ.OFFSET2.LIST	no	-800..800 *(-)*	List of offsets coordinates in DEC or Y
Fixed values:			
Parameter	Hidden	Value	Label

5.2.11 ERIS_nixIMG_tec_CheckDistortion

This template should run once a month as health check of the distortion mask. It uses sieve mask in the aperture wheel to check for the stability of the distortion.

ERIS_nixIMG_tec_CheckDistortion.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
DET.DIT	no	0.0..1800.0 *(-)*	Detector integration time
DET.NDIT	no	1..31775 *(-)*	Number of detector integrations
DET.READOUT	no	SLOW_GR_UTR FAST_UNCORR *(SLOW_GR_UTR)*	Detector readout mode
INS.NXCW.NAME	no	13mas-JHK 27mas-JHK 13mas-LM *(-)*	NIX camera wheel
INS.NXFW.NAME	no	J H Ks Pa-b Fe-II H2-cont H2-1-0S Br-g K-peak IB-2.42 IB-2.48 Short-Lp Lp Mp Br-a-cont Br-a *(-)*	NIX filter wheel
INS.NXPW.NAME	no	JHK-pupil Blocking LM-pupil Spider ND *(-)*	NIX pupil wheel
INS.QTH.INTENS	no	0..100 *(50)*	Quartz halogen lamp intensity in percentage
SEQ.NEXPO	no	1..99 *(1)*	Number of exposures per DIT
Fixed values:			
Parameter	Hidden	Value	Label
DPR.CATG	no	TECHNICAL	Data product category
DPR.TECH	no	IMAGE	Data product technique
DPR.TYPE	no	DISTORTION	Data product type
INS.NXAW.NAME	no	Pinholes	NIX aperture wheel, need to match NXCW, NIX.OPTI2
SEQ.CUBE.ST	no	T	Store Data Cube? (T/F)
SEQ.DO.PERSIST.ST	no	T	record persistence data? (T/F)
SEQ.EXT.FOCUS.CU	no	T	T focusOffset Val sent to CU; otherwise, sent to DSM
SEQ.MULTI.SHORT.EXP	no	T	T: multi short exposure, F: single long exposure
SEQ.NIX.FOCUS.POS	no	EXTERNAL	NXDF pos. EXTERNAL: for External Focus ; INTERNAL: for internal Focus; PUPILIMG: for Pupil_IMG

5.2.12 ERIS_tec_FixSetup4NIX

To be written.

ERIS_tec_FixSetup4NIX.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
INS.NXAW.NAME	no	Crosshairs Pinholes Slit Small Dark1 Large Vortex-L Vortex-M *(-)*	NIX aperture wheel, need to match NXCW, NIX.OPTI2
INS.NXCW.NAME	no	13mas-JHK 27mas-JHK 13mas-LM 13mas-LSS *(-)*	NIX camera wheel
INS.NXDF.NAME	no	E-cam1-S E-cam2-S E-cam3-S E-cam1-D E-cam2-D E-cam3-D E-APP-JHK E-APP-LM E-Vortex E-LSS I-cam1-S I-cam2-S I-cam3-S I-cam1-D I-cam2-D I-cam3-D Pupil-K-S Pupil-K-D Pupil-L-S Pupil-L-D *(-)*	NIX detector focus
INS.NXFW.NAME	no	Open1 IB-2.48 IB-2.42 Br-a-cont Br-a Br-g L-Broad Mp Short-Lp Lp Dark1 J H Ks Pa-b Fe-II H2-cont H2-1-0S K-peak Dark2 *(-)*	NIX filter wheel
INS.NXIS.NAME	no	27mas-JHK Dark1 13mas-JHK 13mas-LM Dark2 Pupil 13mas-LSS APP-JHK APP-LM Vortex Dark3 *(-)*	NIX plate scale. Must match the camera wheel NXCW

INS.NXPW.NAME	no	Crosshairs Dark3 Dark4 Dark5 Open1 Lyot-ND ND Lyot Spider LM-pupil Dark1 JHK-pupil Blocking APP Grism SAM-7 SAM-9 SAM-23 Open Dark2 *(-)*	NIX pupil wheel
Fixed values:			
Parameter	Hidden	Value	Label

5.3 AO Templates

5.3.1 ERIS_ao_obs_LaserLeakage

ERIS_ao_obs_LaserLeakage.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
SEQ.AO.LASER_DETUNE	yes	T F *(T)*	Detune laser?
SEQ.AO.LASER_START	yes	T F *(T)*	Start laser propagation?
SEQ.AO.LASER_STOP	yes	T F *(F)*	Stop laser propagation?
SEQ.AO.REC_TIME	yes	0..1000 *(1.0)*	Setup time for SPARTA recorders
SEQ.AO.SPIRAL_DELTA	yes	0..1000 *(1)*	Delta movement of laser leakage spiral search
SEQ.AO.SPIRAL_SIZE	yes	0..100 *(14)*	Spiral search edge size for laser leakage
SEQ.LGS	yes	1..4 *(2)*	Laser ID
SEQ.SE	no	T F *(F)*	Perform acquisition in seeing enhancer mode
Fixed values:			
Parameter	Hidden	Value	Label

5.3.2 ERIS_ao_tec_ChangeDefaultLGS

This templates changes the default value of the SEQ.LGS keyword, which identifies the used laser beacon.

ERIS_ao_tec_ChangeDefaultLGS.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
SEQ.INTERACTIVE	no	T F *(F)*	Interactive
SEQ.LGS	yes	1..4 *(2)*	Laser ID
Fixed values:			
Parameter	Hidden	Value	Label

5.3.3 ERIS_ao_tec_DsmFlatteningCmd

This template is used to save a reference flat for the DSM. A series of DSM command frames are read from SPARTA, averaged, and saved as a "flat" file for future use. The standard deviation for each actuator is also computed. Average and standard deviation data are saved into long-term storage to be able to compute historical trends. In order to have a good measurement quality, when this template is run the AO NGS loop must be closed on a bright star ($7 < mag_R < 10$), at a low zenith angle (<15 degrees) and with the highest possible number of controlled modes.

This template is intended to be run in closed loop on sky, therefore it does not perform any INS or SPARTA setup.

ERIS_ao_tec_DsmFlatteningCmd.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
SEQ.AO.NDIT	no	1..10000 *(1000)*	Number of detector integration time
Fixed values:			
Parameter	Hidden	Value	Label
SEQ.STORE	no	F	Store result

5.3.4 ERIS_ao_tec_Engineering

To be written.

ERIS_ao_tec_Engineering.tsf

To be specified:			
Parameter	Hidden	Range *(Default)*	Label
SEQ.ACTION	no	TT_NGS_CU TT_LGS_CU TT_LO_CU TT_NGS_DSM TT_LO_DSM *(TT_NGS_CU)*	Action to be performed
Fixed values:			
Parameter	Hidden	Value	Label

5.3.5 ERIS_ao_tec_FreeSetup

Configures all AO and CU devices

ERIS_ao_tec_FreeSetup.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
INS.ADC1.MODE	no	AUTO OFF *()*	ADC1 tracking mode
INS.ADC1.POSANG	no	0..360 *()*	ADC1 position
INS.ADC2.MODE	no	AUTO OFF *()*	ADC2 tracking mode
INS.ADC2.POSANG	no	0..360 *()*	ADC2 position
INS.AO.NAME	no	NGS_ONAXIS_CU LO_ONAXIS_CU LGS_ONAXIS_CU SAFE NGS_OPEN LGS_OPEN NGS_SKY SE_SKY LGS_SKY *()*	AO configuration
INS.AOTRACK.NAME	no	NGS_TEC NGS_TEC_45 LGS_TEC LGS_TEC_45 SE_TEC SE_TEC_45 NGS_SKY LGS_SKY SE_SKY *()*	AO tracking
INS.CAL.NAME	no	OFF PPL FPN_EXT FPL_EXT FPN_DLNIR FPL_DLNIR *()*	CU configuration
INS.FSSL.NAME	no	MMIS MMSL MMPH SMVIS SMNIR *()*	FSSL configuration
INS.IBSM.NAME	no	CALUNIT TELBEAM *()*	CU selector mirror
INS.ISSM.NAME	no	IN OUT *()*	ISSM position
INS.LAMPS.NAME	no	OFF LDLS_ON QTH_ON NEON_ON ARGO_ON XENO_ON KRIP_ON LDLS_MAG8 LDLS_MAG9 LDLS_MAG10 LDLS_MAG12 LDLS_MAG14 LDLS_MAG16 LDLS_MAG20 *()*	Lamps configuration
INS.LGPM.X	no	0..10000 *()*	LGS pupil mirror X position
INS.LGPM.Y	no	0..10000 *()*	LGS pupil mirror Y position
INS.LGRT.MODE	no	STAT SKY ELEV USER *()*	LGRT tracking mode
INS.LGRT.POSANG	no	0..360 *()*	LGRT position angle
INS.LGSF.MODE	no	STAT TRACK *()*	LGSF tracking mode
INS.LGSF.ZPOS	no	0.01..93.2 *()*	LGS focus stage
INS.MODE	no	IFS nix nixIMG nixAPP nixFPC nixLSS nixSAM *()*	ERIS Instrument Mode
INS.NDSL.NAME	no	Dmag0 Dmag1 Dmag2 Dmag3 Dmag4 Dmag5 Dmag6 Dmag7 Dmag8 Dmag9 Dmag10 Dmag11 Dmag12 *()*	NDSL configuration
INS.NGFP.CSYSTEM	no	-35.0..35.0 *()*	NGS field patrol
INS.NGFP.MODE	no	STAT POINT TRACK *()*	NGFP tracking mode
INS.NGFP.XPOS	no	-35.0..35.0 *()*	NGFP X position
INS.NGFP.YPOS	no	-35.0..35.0 *()*	NGFP X position
INS.NGFW.NAME	no	OPEN ND1 ND2 BLOCK *()*	NGS filter wheel
INS.NGIR.NAME	no	MIN_POS MAX_FOV HALF_POS MAX_POS SMALL MEDIUM LARGE *()*	NGS iris
INS.NGPM.X	no	0..10000 *()*	NGS pupil mirror X position
INS.NGPM.Y	no	0..10000 *()*	NGS pupil mirror Y position
INS.NGRT.MODE	no	STAT SKY ELEV USER *()*	NGRT tracking mode
INS.NGRT.POSANG	no	0..360 *()*	NGRT position
INS.NGSF.POS	no	0.01..20 *()*	NGS focus stage
INS.NGSW.NAME	no	LO HO *()*	NGS Lenslet switch
INS.NXAW.NAME	no	Crosshairs Pinholes Slit Small Dark1 Large Vortex-L Vortex-M *()*	NIX aperture wheel, need to match NXCW, NIX.OPTI2
INS.NXCW.NAME	no	13mas-JHK 27mas-JHK 13mas-LM 13mas-LSS *()*	NIX camera wheel
INS.NXDF.NAME	no	E-cam1-S E-cam2-S E-cam3-S E-cam1-D E-cam2-D E-cam3-D E-APP-JHK E-APP-LM E-Vortex E-LSS I-cam1-S I-cam2-S I-cam3-S I-cam1-D I-cam2-D I-cam3-D Pupil-K-S Pupil-K-D Pupil-L-S Pupil-L-D *()*	NIX detector focus

INS.NXFW.NAME	no	Open1 IB-2.48 IB-2.42 Br-a-cont Br-a Br-g L-Broad Mp Short-Lp Lp Dark1 J H Ks Pa-b Fe-II H2-cont H2-1-0S K-peak Dark2 *()*	NIX filter wheel
INS.NXIS.NAME	no	27mas-JHK Dark1 13mas-JHK 13mas-LM Dark2 Pupil 13mas-LSS APP-JHK APP-LM Vortex Dark3 *()*	NIX plate scale. Must match the camera wheel NXCW
INS.NXPW.NAME	no	Crosshairs Dark3 Dark4 Dark5 Open1 Lyot-ND ND Lyot Spider LM-pupil Dark1 JHK-pupil Blocking APP Grism SAM-7 SAM-9 SAM-23 Open Dark2 *()*	NIX pupil wheel
INS.PHMR.NAME	no	MIN_POS DLVIS DLNIR NGS05 NGS10 NGS15 LGS05 LGS10 LGS15 MAX_POS *()*	PHMR position
INS.PHMX.POS	no	1..22 *()*	PHMX position
INS.PHMY.POS	no	1..22 *()*	PHMY position
INS.PHMZ.NAME	no	FOC80KM INFINITY *()*	PHMZ position
INS.SCSM.NAME	no	NIX SPIFFIER *()*	Science selector mirror
INS.SHUT.ST	no	T F *()*	LGS shutter
INS.SPFW.NAME	no	Closed1 K_new 3D_K_1 H+K_new H+K_1 Closed2 J_short J_middle J_long J_new Closed3 H_short H_middle H_long H_middle_long H_new Closed4 Open *()*	Filter wheel position
INS.SPGW.NAME	no	J_low H_low K_low J_short J_middle J_long H_short H_middle H_long K_short K_middle K_long *()*	Grating wheel position
INS.SPXW.NAME	no	25mas 100mas 250mas *()*	SPIFFIER spaxel size
Fixed values:			
Parameter	Hidden	Value	Label

5.3.6 ERIS_ao_tec_FunctionalTest

This template moves all NGS WFS and LGS WFS devices and verifies their correct functionality.

ERIS_ao_tec_FunctionalTest.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
SEQ.DUMMY	no	1..100 *(1)*	Dummy parameter - testing purpose
Fixed values:			
Parameter	Hidden	Value	Label

5.3.7 ERIS_ao_tec_IfsDiffFlexures

This template is the same as ERIS_ao_tec_NixDiffFlexures, but SPIFFIER is used instead of NIX.

ERIS_ao_tec_IfsDiffFlexures.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
INS.AO.NAME	no	NGS_ONAXIS_CU LO_ONAXIS_CU LGS_ONAXIS_CU SAFE NGS_OPEN LGS_OPEN NGS_SKY SE_SKY LGS_SKY *(NGS_ONAXIS_CU)*	AO configuration
INS.AOTRACK.NAME	no	NGS_TEC NGS_TEC_45 LGS_TEC LGS_TEC_45 SE_TEC SE_TEC_45 NGS_SKY LGS_SKY SE_SKY *(NGS_TEC)*	AO tracking
INS.BAND.NAME	no	J_low J_short J_middle J_long H_low H_short H_middle H_long K_low K_short K_middle K_long *(-)*	SPIFFIER grating
INS.CAL.NAME	no	OFF PPL FPN_EXT FPL_EXT FPN_DLNIR FPL_DLNIR *(FPN_DLNIR)*	CU configuration

INS.LAMPS.NAME	no	OFF LDLS_ON QTH_ON NEON_ON ARGO_ON XENO_ON KRIP_ON LDLS_MAG8 LDLS_MAG9 LDLS_MAG10 LDLS_MAG12 LDLS_MAG14 LDLS_MAG16 LDLS_MAG20 *(LDLS_MAG10)*	Lamps configuration
SEQ.ANGLE.END	no	0..720 *(360)*	Stop angle
SEQ.ANGLE.START	no	0..360 *(0)*	Start angle
SEQ.ANGLE.STEP	no	1..180 *(30)*	Angle step
SEQ.AO.NDIT	no	1..10000 *(1000)*	Number of detector integration time
SEQ.CAMERA_GAIN	no	1..400 *(1)*	Camera gain
SEQ.CLOSE_PUPLOOP	no	T F *(F)*	Close pupil loop
SEQ.ELEVATION.END	no	0..90 *(90)*	Stop elevation
SEQ.ELEVATION.START	no	0..90 *(60)*	Start elevation
SEQ.ELEVATION.STEP	no	1..90 *(10)*	Elevation step
SEQ.NO_SETUP	no	T F *(F)*	Avoid applying ICS setup
SEQ.STOP_LAMPS	no	T F *(T)*	Switch LAMPS off after measurement
SEQ.STOP_PIPELINE	no	T F *(T)*	Stop SPARTA pipeline after measurement
Fixed values:			
Parameter	Hidden	Value	Label
DPR.CATG	no	TECHNICAL	Data product category
DPR.TECH	no	IMAGE	Data product technique
DPR.TYPE	no	FLEXURE	Data product type

5.3.8 ERIS_ao_tec_IfsNCPA

This template is the same as ERIS_ao_tec_NixNCPA, but SPIFFIER is used instead.

ERIS_ao_tec_IfsNCPA.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
DET.DIT	no	0..3600 *(-)*	Detector integration time
DET.NDIT	no	1..100 *(-)*	Number of detector integrations
DET.READOUT	no	SLOW_GR_UTR FAST_UNCORR *(SLOW_GR_UTR)*	Detector readout mode
INS.SPFW.NAME	no	Closed1 K_new 3D_K_1 H+K_new H+K_1 Closed2 J_short J_middle J_long J_new Closed3 H_short H_middle H_long H_middle_long H_new Closed4 Open *(J_new)*	Filter wheel position
INS.SPGW.NAME	no	J_low H_low K_low J_short J_middle J_long H_short H_middle H_long K_short K_middle K_long *(J_low)*	Grating wheel position
INS.SPXW.NAME	no	25mas 100mas 250mas *(25mas)*	SPIFFIER spaxel size
SEQ.CHK_NIX	no	T F *(F)*	Check NIX
SEQ.CHK_SPIFFIER	no	T F *(T)*	Check SPIFFIER
SEQ.CUBE.PERS	no	F T *(F)*	Store Data Cube for persistence? (T/F)
SEQ.INSTALL_CFG	no	T F *(F)*	Install configuration
SEQ.INTERACTIVE	no	T F *(F)*	Interactive
SEQ.NCPA.MODE	no	1..20 *(-)*	Mode
SEQ.NCPA.START	no	-100..100 *(-100e-9)*	scan start position
SEQ.NCPA.STEP	no	0..100 *(20e-9)*	scan step
SEQ.NCPA.STOP	no	-100..100 *(100e-9)*	scan stop position
SEQ.STOP_PIPELINE	no	T F *(T)*	Stop SPARTA pipeline after measurement
Fixed values:			
Parameter	Hidden	Value	Label
DPR.CATG	no	TECHNICAL	Data product category
DPR.TECH	no	IMAGE	Data product technique
DPR.TYPE	no	PSF-CALIBRATOR,NCPA	Data product type
INS.NXCW.NAME	no	13mas-JHK	NIX camera wheel
INS.NXFW.NAME	no	Fe-II	NIX filter wheel
INS.NXPW.NAME	no	JHK-pupil	NIX pupil wheel

5.3.9 ERIS_ao_tec_LGS_CUtiptiltIM

This template measures the Interaction Matrix between the PHMX and Y movements and the AO tip-tilt signal on the LGS wavefront sensor. After the measurement, it generates and saves a 2x2 reconstructor matrix which can be used to adjust the PHMX/Y position based on the AO tip-tilt signal. This matrix is intended to be used during the execution of the differential flexures and NCPA templates.

ERIS_ao_tec_LGS_CUtiptiltIM.tsf

To be specified:			
Parameter	Hidden	Range *(Default)*	Label
INS.AO.NAME	no	NGS_ONAXIS_CU LO_ONAXIS_CU LGS_ONAXIS_CU SAFE NGS_OPEN LGS_OPEN NGS_SKY SE_SKY LGS_SKY *(LGS_ONAXIS_CU)*	AO configuration
INS.AOTRACK.NAME	no	NGS_TEC NGS_TEC_45 LGS_TEC LGS_TEC_45 SE_TEC SE_TEC_45 NGS_SKY LGS_SKY SE_SKY *(LGS_TEC)*	AO tracking
INS.CAL.NAME	no	OFF PPL FPN_EXT FPL_EXT FPN_DLNIR FPL_DLNIR *(FPL_DLNIR)*	CU configuration
INS.LAMPS.NAME	no	OFF LDLS_ON QTH_ON NEON_ON ARGO_ON XENO_ON KRIP_ON LDLS_MAG8 LDLS_MAG9 LDLS_MAG10 LDLS_MAG12 LDLS_MAG14 LDLS_MAG16 LDLS_MAG20 *(LDLS_MAG10)*	Lamps configuration
SEQ.AO.NDIT	no	1..10000 *(1000)*	Number of detector integration time
SEQ.CAMERA_GAIN	no	1..400 *(1)*	Camera gain
SEQ.CHK_NIX	no	T F *(F)*	Check NIX
SEQ.CHK_SPIFFIER	no	T F *(F)*	Check SPIFFIER
SEQ.INSTALL_CFG	no	T F *(F)*	Install configuration
SEQ.INTERACTIVE	no	T F *(F)*	Interactive
SEQ.NO_SETUP	no	T F *(F)*	Avoid applying ICS setup
SEQ.STOP_LAMPS	no	T F *(T)*	Switch LAMPS off after measurement
SEQ.STOP_PIPELINE	no	T F *(T)*	Stop SPARTA pipeline after measurement
SEQ.SUBAPS.THRESHOLD	no	0..1 *(0.1)*	Illumination threshold
SEQ.XPOS.LIST	yes	0..10 *(-1 0 0 0 1)*	list of X positions
SEQ.YPOS.LIST	yes	0..10 *(0 -1 0 1 0)*	list of Y positions
Fixed values:			
Parameter	Hidden	Value	Label

5.3.10 ERIS_ao_tec_LGSCcdDark

Measure a series of dark frames on the LGS WFS camera, one for each possible DIT. Dark frames are stored on disk and will be used in the AO acquisition sequence. The list of possible DITs is automatically determined scanning the AO configuration tables.

ERIS_ao_tec_LGSCcdDark.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
SEQ.AO.NDIT	no	1..10000 *(1000)*	Number of detector integration time
SEQ.STOP_PIPELINE	no	T F *(T)*	Stop SPARTA pipeline after measurement
Fixed values:			
Parameter	Hidden	Value	Label

5.3.11 ERIS_ao_tec_LGSCcdGain

Same as ERIS_ao_tec_NGSCcdGain for the LGS WFS. Data analysis routines are the same.

ERIS_ao_tec_LGSCcdGain.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
INS.AO.NAME	no	NGS_ONAXIS_CU LO_ONAXIS_CU LGS_ONAXIS_CU SAFE NGS_OPEN LGS_OPEN NGS_SKY SE_SKY LGS_SKY *(LGS_ONAXIS_CU)*	AO configuration
INS.AOTRACK.NAME	no	NGS_TEC NGS_TEC_45 LGS_TEC LGS_TEC_45 SE_TEC SE_TEC_45 NGS_SKY LGS_SKY SE_SKY *(LGS_TEC)*	AO tracking
INS.CAL.NAME	no	OFF PPL FPN_EXT FPL_EXT FPN_DLNIR FPL_DLNIR *(FPL_DLNIR)*	CU configuration

INS.LAMPS.NAME	no	OFF LDLS_ON QTH_ON NEON_ON ARGO_ON XENO_ON KRIP_ON LDLS_MAG8 LDLS_MAG9 LDLS_MAG10 LDLS_MAG12 LDLS_MAG14 LDLS_MAG16 LDLS_MAG20 *(QTH_ON)*	Lamps configuration
SEQ.AO.NDIT	no	1..10000 *(1000)*	Number of detector integration time
SEQ.CAMERA_FRAMERATE	no	1..1000 *(1000 500)*	Camera framerate in Hz
SEQ.CAMERA_GAIN	no	1..400 *(1)*	Camera gain
SEQ.INTERACTIVE	no	T F *(F)*	Interactive
SEQ.NO_SETUP	no	T F *(F)*	Avoid applying ICS setup
SEQ.STOP_LAMPS	no	T F *(T)*	Switch LAMPS off after measurement
SEQ.STOP_PIPELINE	no	T F *(T)*	Stop SPARTA pipeline after measurement
SEQ.THRESHOLD	no	0..1e9 *(0.3)*	Threshold
Fixed values:			
Parameter	Hidden	Value	Label

5.3.12 ERIS_ao_tec_LGSCcdRon

Same as ERIS_ao_tec_NGSCcdRon, for the LGS WFS. The LGS shutter is used to block light. Data analysis routines are the same.

ERIS_ao_tec_LGSCcdRon.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
SEQ.AO.NDIT	no	1..10000 *(1000)*	Number of detector integration time
SEQ.CAMERA_GAIN	no	1..400 *(1)*	Camera gain
SEQ.CHK_LGS	no	T F *(T)*	Check LGS
SEQ.CHK_LO	no	T F *(F)*	Check LO channel
SEQ.MOTORS	no	T F *(F)*	Turn on motors
SEQ.NO_SETUP	no	T F *(T)*	Avoid applying ICS setup
SEQ.RON_THRESHOLD	no	0..1e9 *(0.5)*	Threshold
SEQ.STOP_PIPELINE	no	T F *(T)*	Stop SPARTA pipeline after measurement
Fixed values:			
Parameter	Hidden	Value	Label

5.3.13 ERIS_ao_tec_LGSCheckPupil

This template performs an LGS pupil check of the AO system already in closed loop. It does NOT setup any configuration. It gets the list of VALID subaps from SPARTA and verifies that exactly all VALID subaps are well illuminated.

ERIS_ao_tec_LGSCheckPupil.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
SEQ.AO.NDIT	no	1..10000 *(100)*	Number of detector integration time
SEQ.SUBAPS.THRESHOLD	no	0..1 *(0.1)*	Illumination threshold
Fixed values:			
Parameter	Hidden	Value	Label
SEQ.CHK_LGS	no	T	Check LGS
SEQ.CHK_NGS	no	F	Check NGS

5.3.14 ERIS_ao_tec_LGSFieldStop

Checks the LGS field vignetting, moving the CU source in steps across the field of view on a grid. A linear motion on a single axis can be obtained setting the START and STOP values to the same value for the other axis. At each grid point, a series of pixel and slope frames are read and averaged form the LGS detector using the SPARTA pixel and loop recorders.

ERIS_ao_tec_LGSFieldStop.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
INS.AO.NAME	no	NGS_ONAXIS_CU LO_ONAXIS_CU LGS_ONAXIS_CU SAFE NGS_OPEN LGS_OPEN NGS_SKY SE_SKY LGS_SKY *(LGS_ONAXIS_CU)*	AO configuration
INS.AOTRACK.NAME	no	NGS_TEC NGS_TEC_45 LGS_TEC LGS_TEC_45 SE_TEC SE_TEC_45 NGS_SKY LGS_SKY SE_SKY *(LGS_TEC)*	AO tracking

INS.CAL.NAME	no	OFF PPL FPN_EXT FPL_EXT FPN_DLNIR FPL_DLNIR *(FPL_DLNIR)*	CU configuration
INS.LAMPS.NAME	no	OFF LDLS_ON QTH_ON NEON_ON ARGO_ON XENO_ON KRIP_ON LDLS_MAG8 LDLS_MAG9 LDLS_MAG10 LDLS_MAG12 LDLS_MAG14 LDLS_MAG16 LDLS_MAG20 *(LDLS_MAG10)*	Lamps configuration
SEQ.AO.NDIT	no	1..10000 *(1000)*	Number of detector integration time
SEQ.CAMERA_GAIN	no	1..400 *(1)*	Camera gain
SEQ.CLOSE_PUPLOOP	no	T F *(F)*	Close pupil loop
SEQ.CU	no	T F *(T)*	Use CU
SEQ.NO_SETUP	no	T F *(F)*	Avoid applying ICS setup
SEQ.STOP_LAMPS	no	T F *(T)*	Switch LAMPS off after measurement
SEQ.STOP_PIPELINE	no	T F *(T)*	Stop SPARTA pipeline after measurement
SEQ.SUBAPS.THRESHOLD	no	0..1 *(0.1)*	Illumination threshold
SEQ.XPOS.START	no	-100..100 *(-1)*	X scan start position
SEQ.XPOS.STEP	no	0..100 *(1)*	X scan step
SEQ.XPOS.STOP	no	-100..100 *(1)*	X scan stop position
SEQ.YPOS.START	no	-100..100 *(-1)*	Y scan start position
SEQ.YPOS.STEP	no	0..100 *(1)*	Y scan step
SEQ.YPOS.STOP	no	-100..100 *(1)*	Y scan stop position
Fixed values:			
Parameter	Hidden	Value	Label

5.3.15 ERIS_ao_tec_LGSFocus

Measures LGS focus stage position that maximizes the PSF strehl ratio on NIX or SPIFFIER. The measurement is done in closed loop, acquiring a series of PSFs from NIX or SPIFFIER, moving the LGS focus stage in steps over a configurable range. After the acquisition, the best focus position is identified and optionally saved on disk as the reference focus position for SE mode.

This template is intended to be run in closed loop, therefore it does not perform any INS or SPARTA setup.

ERIS_ao_tec_LGSFocus.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
DET.DIT	no	0.0..1800.0 *(-)*	Detector integration time
DET.NDIT	no	1..31775 *(-)*	Number of detector integrations
DET.READOUT	no	SLOW_GR_UTR FAST_UNCORR *(SLOW_GR_UTR)*	Detector readout mode
DET.WIN.NX	no	2048 *(2048)*	Window Size in X
DET.WIN.NY	no	64 128 256 384 512 768 1024 2048 *(2048)*	Window Size in Y
DET.WIN.STARTX	no	1..2048 *(1)*	First column of window
DET.WIN.STARTY	no	1..2048 *(1)*	First row of window
INS.NXCW.NAME	no	13mas-JHK 27mas-JHK 13mas-LM 13mas-LSS *(13mas-JHK)*	NIX camera wheel
INS.NXFW.NAME	no	Open1 IB-2.48 IB-2.42 Br-a-cont Br-a Br-g L-Broad Mp Short-Lp Lp Dark1 J H Ks Pa-b Fe-II H2-cont H2-1-0S K-peak Dark2 *(Fe-II)*	NIX filter wheel
INS.NXPW.NAME	no	Crosshairs Dark3 Dark4 Dark5 Open1 Lyot-ND ND Lyot Spider LM-pupil Dark1 JHK-pupil Blocking APP Grism SAM-7 SAM-9 SAM-23 Open Dark2 *(JHK-pupil)*	NIX pupil wheel
INS.SPFW.NAME	no	Closed1 K_new 3D_K_1 H+K_new H+K_1 Closed2 J_short J_middle J_long J_new Closed3 H_short H_middle H_long H_middle_long H_new Closed4 Open *(J_new)*	Filter wheel position
INS.SPGW.NAME	no	J_low H_low K_low J_short J_middle J_long H_short H_middle H_long K_short K_middle K_long *(J_low)*	Grating wheel position
INS.SPXW.NAME	no	25mas 100mas 250mas *(25mas)*	SPIFFIER spaxel size
SEQ.CHK_NIX	no	T F *(T)*	Check NIX
SEQ.CHK_SPIFFIER	no	T F *(T)*	Check SPIFFIER
SEQ.CUBE.PERS	no	F T *(F)*	Store Data Cube for persistence? (T/F)
SEQ.FOCUS.START	no	0..100 *(10)*	Focus scan start position
SEQ.FOCUS.STEP	no	0..100 *(0.2)*	Focus scan step
SEQ.FOCUS.STOP	no	0..100 *(12)*	Focus scan stop position

SEQ.INSTALL_CFG	no	T F *(F)*	Install configuration
SEQ.INTERACTIVE	no	T F *(F)*	Interactive
SEQ.WSIZE	no	2..2048 *(100)*	Window size
Fixed values:			
Parameter	Hidden	Value	Label
DPR.CATG	no	TECHNICAL	Data product category
DPR.TECH	no	IMAGE	Data product technique
DPR.TYPE	no	FOCUS	Data product type
SEQ.CHK_LGS	no	T	Check LGS
SEQ.CHK_LO	no	F	Check LO channel
SEQ.CHK_NGS	no	F	Check NGS

5.3.16 ERIS_ao_tec_LGSNGCGain

This template measures the gain of the LGS wavefront sensor by executing the ESO NGC Exposure Driver Tool.

ERIS_ao_tec_LGSNGCGain.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
INS.AO.NAME	no	NGS_ONAXIS_CU LO_ONAXIS_CU LGS_ONAXIS_CU SAFE NGS_OPEN LGS_OPEN NGS_SKY SE_SKY LGS_SKY *(LGS_ONAXIS_CU)*	AO configuration
INS.AOTRACK.NAME	no	NGS_TEC NGS_TEC_45 LGS_TEC LGS_TEC_45 SE_TEC SE_TEC_45 NGS_SKY LGS_SKY SE_SKY *(LGS_TEC)*	AO tracking
INS.CAL.NAME	no	OFF PPL FPN_EXT FPL_EXT FPN_DLNIR FPL_DLNIR *(FPL_DLNIR)*	CU configuration
INS.LAMPS.NAME	no	OFF LDLS_ON QTH_ON NEON_ON ARGO_ON XENO_ON KRIP_ON LDLS_MAG8 LDLS_MAG9 LDLS_MAG10 LDLS_MAG12 LDLS_MAG14 LDLS_MAG16 LDLS_MAG20 *(LDLS_MAG10)*	Lamps configuration
SEQ.CAMERA_FRAMERATE	no	1..1000 *(1000)*	Camera framerate in Hz
SEQ.CAMERA_GAIN	no	1..400 *(1)*	Camera gain
SEQ.NO_SETUP	no	T F *(F)*	Avoid applying ICS setup
SEQ.STOP_LAMPS	no	T F *(T)*	Switch LAMPS off after measurement
SEQ.STOP_PIPELINE	no	T F *(T)*	Stop SPARTA pipeline after measurement
Fixed values:			
Parameter	Hidden	Value	Label

5.3.17 ERIS_ao_tec_LGSPerfScan

TO BE WRITTEN

ERIS_ao_tec_LGSPerfScan.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
DET.DIT	no	0.0..1800.0 *(-)*	Detector integration time
DET.NDIT	no	1..31775 *(-)*	Number of detector integrations
DET.READOUT	no	SLOW_GR_UTR FAST_UNCORR *(SLOW_GR_UTR)*	Detector readout mode
INS.NXCW.NAME	no	13mas-JHK 27mas-JHK 13mas-LM 13mas-LSS *(13mas-JHK)*	NIX camera wheel
INS.NXFW.NAME	no	Open1 IB-2.48 IB-2.42 Br-a-cont Br-a Br-g L-Broad Mp Short-Lp Lp Dark1 J H Ks Pa-b Fe-II H2-cont H2-1-0S K-peak Dark2 *(Fe-II)*	NIX filter wheel
INS.NXPW.NAME	no	Crosshairs Dark3 Dark4 Dark5 Open1 Lyot-ND ND Lyot Spider LM-pupil Dark1 JHK-pupil Blocking APP Grism SAM-7 SAM-9 SAM-23 Open Dark2 *(JHK-pupil)*	NIX pupil wheel

INS.SPFW.NAME	no	Closed1 K_new 3D_K_1 H+K_new H+K_1 Closed2 J_short J_middle J_long J_new Closed3 H_short H_middle H_long H_middle_long H_new Closed4 Open *(J_new)*	Filter wheel position
INS.SPGW.NAME	no	J_low H_low K_low J_short J_middle J_long H_short H_middle H_long K_short K_middle K_long *(J_low)*	Grating wheel position
INS.SPXW.NAME	no	25mas 100mas 250mas *(25mas)*	SPIFFIER spaxel size
SEQ.CHK_NIX	no	T F *(T)*	Check NIX
SEQ.CHK_SPIFFIER	no	T F *(T)*	Check SPIFFIER
SEQ.CUBE.PERS	no	F T *(F)*	Store Data Cube for persistence? (T/F)
SEQ.FREQ.LIST	yes	*(-)*	List of SPARTA WFS frequencies
SEQ.MAG	no	-2.0..25.0 *(8)*	Detected magnitude
SEQ.MODES.LIST	yes	*(-)*	List of SPARTA modes
SEQ.NGIR.NAME.LIST	no	MIN_POS MAX_FOV HALF_POS MAX_POS SMALL MEDIUM LARGE *(-)*	List of nominal NGIR position
SEQ.WEIGHTS.LIST	yes	*(-)*	List of SPARTA weighting maps
Fixed values:			
Parameter	Hidden	Value	Label
SEQ.CHK_LGS	no	T	Check LGS
SEQ.CHK_LO	no	F	Check LO channel
SEQ.CHK_NGS	no	F	Check NGS

5.3.18 ERIS_ao_tec_LGSPmPsf

Calibrates the LGS pupil and PSF position displacement due to the LGPM movement. After the calibration, generates and saves a 2x2 reconstructor matrix which can be used to adjust the LPGM position based on the current pupil position. This reconstructor is used by the auxiliary loop SL3 to center the LGS pupil on the LGS detector during closed loop operation.

ERIS_ao_tec_LGSPmPsf.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
INS.AO.NAME	no	NGS_ONAXIS_CU LO_ONAXIS_CU LGS_ONAXIS_CU SAFE NGS_OPEN LGS_OPEN NGS_SKY SE_SKY LGS_SKY *(LGS_ONAXIS_CU)*	AO configuration
INS.AOTRACK.NAME	no	NGS_TEC NGS_TEC_45 LGS_TEC LGS_TEC_45 SE_TEC SE_TEC_45 NGS_SKY LGS_SKY SE_SKY *(SE_TEC)*	AO tracking
INS.CAL.NAME	no	OFF PPL FPN_EXT FPL_EXT FPN_DLNIR FPL_DLNIR *(FPL_DLNIR)*	CU configuration
INS.LAMPS.NAME	no	OFF LDLS_ON QTH_ON NEON_ON ARGO_ON XENO_ON KRIP_ON LDLS_MAG8 LDLS_MAG9 LDLS_MAG10 LDLS_MAG12 LDLS_MAG14 LDLS_MAG16 LDLS_MAG20 *(LDLS_MAG10)*	Lamps configuration
SEQ.AO.NDIT	no	1..10000 *(1000)*	Number of detector integration time
SEQ.CAMERA_GAIN	no	1..400 *(1)*	Camera gain
SEQ.CHK_LGS	no	T F *(F)*	Check LGS
SEQ.DELAY	no	0..1000 *(0)*	Delay between steps
SEQ.INSTALL_CFG	no	T F *(F)*	Install configuration
SEQ.INTERACTIVE	no	T F *(F)*	Interactive
SEQ.NO_SETUP	no	T F *(F)*	Avoid applying ICS setup
SEQ.STOP_LAMPS	no	T F *(T)*	Switch LAMPS off after measurement
SEQ.STOP_PIPELINE	no	T F *(T)*	Stop SPARTA pipeline after measurement
SEQ.SUBAPS.THRESHOLD	no	0..1 *(0.1)*	Illumination threshold
SEQ.THRESHOLD	no	0..1e9 *(0)*	Threshold
SEQ.XPOS.LIST	yes	0..10 *(4 5 5 5 6)*	list of X positions
SEQ.YPOS.LIST	yes	0..10 *(5 4 5 6 4)*	list of Y positions
Fixed values:			
Parameter	Hidden	Value	Label

5.3.19 ERIS_ao_tec_LGSRefSlopes

This templates measures and stores the LGS WFS reference slopes.

ERIS_ao_tec_LGSRefSlopes.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
INS.AO.NAME	no	NGS_ONAXIS_CU LO_ONAXIS_CU LGS_ONAXIS_CU SAFE NGS_OPEN LGS_OPEN NGS_SKY SE_SKY LGS_SKY *(LGS_ONAXIS_CU)*	AO configuration
INS.AOTRACK.NAME	no	NGS_TEC NGS_TEC_45 LGS_TEC LGS_TEC_45 SE_TEC SE_TEC_45 NGS_SKY LGS_SKY SE_SKY *(SE_TEC)*	AO tracking
INS.CAL.NAME	no	OFF PPL FPN_EXT FPL_EXT FPN_DLNIR FPL_DLNIR *(FPL_DLNIR)*	CU configuration
INS.LAMPS.NAME	no	OFF LDLS_ON QTH_ON NEON_ON ARGO_ON XENO_ON KRIP_ON LDLS_MAG8 LDLS_MAG9 LDLS_MAG10 LDLS_MAG12 LDLS_MAG14 LDLS_MAG16 LDLS_MAG20 *(LDLS_MAG10)*	Lamps configuration
SEQ.ANGLE.END	no	0..720 *(360)*	Stop angle
SEQ.ANGLE.START	no	0..360 *(0)*	Start angle
SEQ.ANGLE.STEP	no	1..180 *(30)*	Angle step
SEQ.AO.NDIT	no	1..10000 *(1000)*	Number of detector integration time
SEQ.CAMERA_GAIN	no	1..400 *(1)*	Camera gain
SEQ.CLOSE_LUTLOOP	no	T F *(F)*	Close LUT loop
SEQ.CLOSE_PUPLOOP	no	T F *(F)*	Close pupil loop
SEQ.DELAY	no	0..1000 *(0)*	Delay between steps
SEQ.INSTALL_CFG	no	T F *(F)*	Install configuration
SEQ.INTERACTIVE	no	T F *(F)*	Interactive
SEQ.ITERATIONS	no	1..1800 *(1)*	Iterations
SEQ.NO_SETUP	no	T F *(F)*	Avoid applying ICS setup
SEQ.STOP_LAMPS	no	T F *(T)*	Switch LAMPS off after measurement
SEQ.STOP_PIPELINE	no	T F *(T)*	Stop SPARTA pipeline after measurement
SEQ.SUBAPS.THRESHOLD	no	0..1 *(0.5)*	Illumination threshold
SEQ.THRESHOLD	no	0..1e9 *(0.8)*	Threshold
Fixed values:			
Parameter	Hidden	Value	Label

5.3.20 ERIS_ao_tec_LGSRotShWobble

This template measures the PSF and pupil offset introduced by the LGRT movement in the LGS wavefront sensor. The LGRT is moved in steps, and at each step a series of slope frames are saved from SPARTA using the loop recorder. The LGS sensor is unable to correct for PSF offset, so the measurement will give an information of how much the PSF will move during observations. Optionally, the template can close the auxiliary loop for pupil compensation. In this case, the pupil offset cannot be measured, and the LGPM command that is executing the pupil compensation is reported instead.

ERIS_ao_tec_LGSRotShWobble.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
INS.AO.NAME	no	NGS_ONAXIS_CU LO_ONAXIS_CU LGS_ONAXIS_CU SAFE NGS_OPEN LGS_OPEN NGS_SKY SE_SKY LGS_SKY *(LGS_ONAXIS_CU)*	AO configuration
INS.AOTRACK.NAME	no	NGS_TEC NGS_TEC_45 LGS_TEC LGS_TEC_45 SE_TEC SE_TEC_45 NGS_SKY LGS_SKY SE_SKY *(SE_TEC)*	AO tracking
INS.CAL.NAME	no	OFF PPL FPN_EXT FPL_EXT FPN_DLNIR FPL_DLNIR *(FPL_DLNIR)*	CU configuration
INS.LAMPS.NAME	no	OFF LDLS_ON QTH_ON NEON_ON ARGO_ON XENO_ON KRIP_ON LDLS_MAG8 LDLS_MAG9 LDLS_MAG10 LDLS_MAG12 LDLS_MAG14 LDLS_MAG16 LDLS_MAG20 *(LDLS_MAG10)*	Lamps configuration
SEQ.ANGLE.END	no	0..720 *(360)*	Stop angle
SEQ.ANGLE.START	no	0..360 *(0)*	Start angle
SEQ.ANGLE.STEP	no	1..180 *(30)*	Angle step
SEQ.AO.NDIT	no	1..10000 *(1000)*	Number of detector integration time

SEQ.CAMERA_GAIN	no	1..400 *(1)*	Camera gain
SEQ.CHK_LGS	no	T F *(F)*	Check LGS
SEQ.CLOSE_LUTLOOP	no	T F *(F)*	Close LUT loop
SEQ.CLOSE_PUPLOOP	no	T F *(F)*	Close pupil loop
SEQ.DELAY	no	0..1000 *(0)*	Delay between steps
SEQ.INSTALL_CFG	no	T F *(F)*	Install configuration
SEQ.INTERACTIVE	no	T F *(F)*	Interactive
SEQ.ITERATIONS	no	1..1800 *(1)*	Iterations
SEQ.NO_SETUP	no	T F *(F)*	Avoid applying ICS setup
SEQ.PUP.THRESHOLD	no	0..1e9 *(0)*	Pupil motion threshold
SEQ.REMOVETT	no	T F *(T)*	Remove Tip/Tilt
SEQ.STOP_LAMPS	no	T F *(T)*	Switch LAMPS off after measurement
SEQ.STOP_PIPELINE	no	T F *(T)*	Stop SPARTA pipeline after measurement
SEQ.SUBAPS.THRESHOLD	no	0..1 *(0.1)*	Illumination threshold
SEQ.THRESHOLD	no	0..1e9 *(0)*	Threshold
Fixed values:			
Parameter	Hidden	Value	Label
SEQ.R2_THRESHOLD	no	1e9	R2 threshold

5.3.21 ERIS_ao_tec_LGSWFSZStageRepeatability

The template is used to measure the focus stage repeatability in positioning the WFS board for the LGS acquisition. The CU source is kept fixed throughout this test. The source is acquired on LGS WFS through the usage of LGS_ONAXIS_CU assembly and centered in the WFS (until Tip, Tilt and focus signal is null). The initial optimal positions of the the stage is then recorded. In this initial optimal conditions a loop recording is started and a FITS file with a complete header is saved. The initial values are added to the header. The repeatability measurement is then started and, at every iteration of the measurement, the i-index positions of the out-movements lists passed as template parameter is setup for the stage. At the end of each iteration (back to initial position), a loop recorder is started and a FITS file with a complete header is saved so that the Zernike Tip, Tilt and Focus repositioning error are stored in the header The template finally checks that all the collected Tip/Tilt/Focus (i.e. TTF) error values are within a pre-defined threshold.

ERIS_ao_tec_LGSWFSZStageRepeatability.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
INS.AO.NAME	no	NGS_ONAXIS_CU LO_ONAXIS_CU LGS_ONAXIS_CU SAFE NGS_OPEN LGS_OPEN NGS_SKY SE_SKY LGS_SKY *(LGS_ONAXIS_CU)*	AO configuration
INS.AOTRACK.NAME	no	NGS_TEC NGS_TEC_45 LGS_TEC LGS_TEC_45 SE_TEC SE_TEC_45 NGS_SKY LGS_SKY SE_SKY *(LGS_TEC)*	AO tracking
INS.CAL.NAME	no	OFF PPL FPN_EXT FPL_EXT FPN_DLNIR FPL_DLNIR *(FPL_EXT)*	CU configuration
INS.LAMPS.NAME	no	OFF LDLS_ON QTH_ON NEON_ON ARGO_ON XENO_ON KRIP_ON LDLS_MAG8 LDLS_MAG9 LDLS_MAG10 LDLS_MAG12 LDLS_MAG14 LDLS_MAG16 LDLS_MAG20 *(LDLS_MAG8)*	Lamps configuration
SEQ.AO.NDIT	no	1..10000 *(1000)*	Number of detector integration time
SEQ.CAMERA_GAIN	no	1..400 *(1)*	Camera gain
SEQ.CLOSE_PUPLOOP	no	T F *(F)*	Close pupil loop
SEQ.DELAY	no	0..1000 *(0)*	Delay between steps
SEQ.NO_SETUP	no	T F *(F)*	Avoid applying ICS setup
SEQ.REMOVETT	no	T F *(T)*	Remove Tip/Tilt
SEQ.STOP_LAMPS	no	T F *(T)*	Switch LAMPS off after measurement
SEQ.STOP_PIPELINE	no	T F *(T)*	Stop SPARTA pipeline after measurement
SEQ.SUBAPS.THRESHOLD	no	0..1 *(0.1)*	Illumination threshold
SEQ.THRESHOLD	no	0..1e9 *(100)*	Threshold
SEQ.ZPOS.LIST	yes	*(0 0)*	list of Z positions
Fixed values:			
Parameter	Hidden	Value	Label

5.3.22 ERIS_ao_tec_LOFocus

Measures NGS focus stage position in LGS mode (LO channel) that maximizes the PSF strehl ratio on NIX or SPIFFIER. The measurement is done in closed loop, acquiring a series of PSFs from NIX or SPIFFIER, moving the LGS focus stage in steps over a configurable range. After the acquisition, the best focus position is identified and optionally saved on disk as the reference focus position for LO mode.

This template is intended to be run in closed loop with truth sensing active, therefore it does not perform any INS or SPARTA setup.

ERIS_ao_tec_LOFocus.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
DET.DIT	no	0.0..1800.0 *(-)*	Detector integration time
DET.NDIT	no	1..31775 *(-)*	Number of detector integrations
DET.READOUT	no	SLOW_GR_UTR FAST_UNCORR *(SLOW_GR_UTR)*	Detector readout mode
DET.WIN.NX	no	2048 *(2048)*	Window Size in X
DET.WIN.NY	no	64 128 256 384 512 768 1024 2048 *(2048)*	Window Size in Y
DET.WIN.STARTX	no	1..2048 *(1)*	First column of window
DET.WIN.STARTY	no	1..2048 *(1)*	First row of window
INS.NXCW.NAME	no	13mas-JHK 27mas-JHK 13mas-LM 13mas-LSS *(13mas-JHK)*	NIX camera wheel
INS.NXFW.NAME	no	Open1 IB-2.48 IB-2.42 Br-a-cont Br-a Br-g L-Broad Mp Short-Lp Lp Dark1 J H Ks Pa-b Fe-II H2-cont H2-1-0S K-peak Dark2 *(Fe-II)*	NIX filter wheel
INS.NXPW.NAME	no	Crosshairs Dark3 Dark4 Dark5 Open1 Lyot-ND ND Lyot Spider LM-pupil Dark1 JHK-pupil Blocking APP Grism SAM-7 SAM-9 SAM-23 Open Dark2 *(JHK-pupil)*	NIX pupil wheel
INS.SPFW.NAME	no	Closed1 K_new 3D_K_1 H+K_new H+K_1 Closed2 J_short J_middle J_long J_new Closed3 H_short H_middle H_long H_middle_long H_new Closed4 Open *(J_new)*	Filter wheel position
INS.SPGW.NAME	no	J_low H_low K_low J_short J_middle J_long H_short H_middle H_long K_short K_middle K_long *(J_low)*	Grating wheel position
INS.SPXW.NAME	no	25mas 100mas 250mas *(25mas)*	SPIFFIER spaxel size
SEQ.CHK_NIX	no	T F *(T)*	Check NIX
SEQ.CHK_SPIFFIER	no	T F *(T)*	Check SPIFFIER
SEQ.CUBE.PERS	no	F T *(F)*	Store Data Cube for persistence? (T/F)
SEQ.FOCUS.START	no	0..100 *(10)*	Focus scan start position
SEQ.FOCUS.STEP	no	0..100 *(0.2)*	Focus scan step
SEQ.FOCUS.STOP	no	0..100 *(12)*	Focus scan stop position
SEQ.INSTALL_CFG	no	T F *(F)*	Install configuration
SEQ.INTERACTIVE	no	T F *(F)*	Interactive
SEQ.WSIZE	no	2..2048 *(100)*	Window size
Fixed values:			
Parameter	Hidden	Value	Label
DPR.CATG	no	TECHNICAL	Data product category
DPR.TECH	no	IMAGE	Data product technique
DPR.TYPE	no	FOCUS	Data product type
SEQ.CHK_LGS	no	F	Check LGS
SEQ.CHK_LO	no	T	Check LO channel
SEQ.CHK_NGS	no	F	Check NGS

5.3.23 ERIS_ao_tec_LORefSlopes

This templates measures and stores the LO WFS reference slopes.

ERIS_ao_tec_LORefSlopes.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
INS.AO.NAME	no	NGS_ONAXIS_CU LO_ONAXIS_CU LGS_ONAXIS_CU SAFE NGS_OPEN LGS_OPEN NGS_SKY SE_SKY LGS_SKY *(NGS_ONAXIS_CU)*	AO configuration
INS.AOTRACK.NAME	no	NGS_TEC NGS_TEC_45 LGS_TEC LGS_TEC_45 SE_TEC SE_TEC_45 NGS_SKY LGS_SKY SE_SKY *(NGS_TEC)*	AO tracking
INS.CAL.NAME	no	OFF PPL FPN_EXT FPL_EXT FPN_DLNIR FPL_DLNIR *(FPN_DLNIR)*	CU configuration

INS.LAMPS.NAME	no	OFF LDLS_ON QTH_ON NEON_ON ARGO_ON XENO_ON KRIP_ON LDLS_MAG8 LDLS_MAG9 LDLS_MAG10 LDLS_MAG12 LDLS_MAG14 LDLS_MAG16 LDLS_MAG20 *(LDLS_MAG12)*	Lamps configuration
SEQ.ANGLE.END	no	0..720 *(360)*	Stop angle
SEQ.ANGLE.START	no	0..360 *(0)*	Start angle
SEQ.ANGLE.STEP	no	1..180 *(30)*	Angle step
SEQ.AO.NDIT	no	1..10000 *(1000)*	Number of detector integration time
SEQ.CAMERA_GAIN	no	1..400 *(1)*	Camera gain
SEQ.CLOSE_LUTLOOP	no	T F *(F)*	Close LUT loop
SEQ.CLOSE_PUPLOOP	no	T F *(F)*	Close pupil loop
SEQ.DELAY	no	0..1000 *(0)*	Delay between steps
SEQ.INSTALL_CFG	no	T F *(F)*	Install configuration
SEQ.INTERACTIVE	no	T F *(F)*	Interactive
SEQ.ITERATIONS	no	1..1800 *(1)*	Iterations
SEQ.NO_SETUP	no	T F *(F)*	Avoid applying ICS setup
SEQ.STOP_LAMPS	no	T F *(T)*	Switch LAMPS off after measurement
SEQ.STOP_PIPELINE	no	T F *(T)*	Stop SPARTA pipeline after measurement
SEQ.SUBAPS.THRESHOLD	no	0..1 *(0.5)*	Illumination threshold
Fixed values:			
Parameter	Hidden	Value	Label

5.3.24 ERIS_ao_tec_LORotShWobble

To be written.

ERIS_ao_tec_LORotShWobble.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
INS.AO.NAME	no	NGS_ONAXIS_CU LO_ONAXIS_CU LGS_ONAXIS_CU SAFE NGS_OPEN LGS_OPEN NGS_SKY SE_SKY LGS_SKY *(NGS_ONAXIS_CU)*	AO configuration
INS.AOTRACK.NAME	no	NGS_TEC NGS_TEC_45 LGS_TEC LGS_TEC_45 SE_TEC SE_TEC_45 NGS_SKY LGS_SKY SE_SKY *(NGS_TEC)*	AO tracking
INS.CAL.NAME	no	OFF PPL FPN_EXT FPL_EXT FPN_DLNIR FPL_DLNIR *(FPN_DLNIR)*	CU configuration
INS.LAMPS.NAME	no	OFF LDLS_ON QTH_ON NEON_ON ARGO_ON XENO_ON KRIP_ON LDLS_MAG8 LDLS_MAG9 LDLS_MAG10 LDLS_MAG12 LDLS_MAG14 LDLS_MAG16 LDLS_MAG20 *(LDLS_MAG16)*	Lamps configuration
SEQ.ANGLE.END	no	0..720 *(360)*	Stop angle
SEQ.ANGLE.START	no	0..360 *(0)*	Start angle
SEQ.ANGLE.STEP	no	1..180 *(30)*	Angle step
SEQ.AO.NDIT	no	1..10000 *(1000)*	Number of detector integration time
SEQ.CAMERA_GAIN	no	1..400 *(1)*	Camera gain
SEQ.CHK_NGS	no	T F *(F)*	Check NGS
SEQ.CLOSE_LUTLOOP	no	T F *(F)*	Close LUT loop
SEQ.CLOSE_PUPLOOP	no	T F *(F)*	Close pupil loop
SEQ.DELAY	no	0..1000 *(0)*	Delay between steps
SEQ.INSTALL_CFG	no	T F *(F)*	Install configuration
SEQ.INTERACTIVE	no	T F *(F)*	Interactive
SEQ.ITERATIONS	no	1..1800 *(1)*	Iterations
SEQ.NO_SETUP	no	T F *(F)*	Avoid applying ICS setup
SEQ.PUP.THRESHOLD	no	0..1e9 *(10)*	Pupil motion threshold
SEQ.R2_THRESHOLD	no	0..1e9 *(0.05)*	R2 threshold
SEQ.REMOVETT	no	T F *(T)*	Remove Tip/Tilt
SEQ.STOP_LAMPS	no	T F *(T)*	Switch LAMPS off after measurement
SEQ.STOP_PIPELINE	no	T F *(T)*	Stop SPARTA pipeline after measurement
SEQ.SUBAPS.THRESHOLD	no	0..1 *(0.1)*	Illumination threshold
SEQ.THRESHOLD	no	0..1e9 *(0)*	Threshold
Fixed values:			
Parameter	Hidden	Value	Label

5.3.25 ERIS_ao_tec_NGFPtiptiltIM

Measures the Interaction Matrix between the NGFP X and Y movements and the AO tip-tilt signal. After the measurement, generates and saves a 2x2 reconstructor matrix which can be used to adjust the NGFP XY position based on the AO tip-tilt signal. This matrix is used by other technical templates to convert their AO tip-tilt measurement into an NGFP offset.

ERIS_ao_tec_NGFPtiptiltIM.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
INS.AO.NAME	no	NGS_ONAXIS_CU LO_ONAXIS_CU LGS_ONAXIS_CU SAFE NGS_OPEN LGS_OPEN NGS_SKY SE_SKY LGS_SKY *(NGS_ONAXIS_CU)*	AO configuration
INS.AOTRACK.NAME	no	NGS_TEC NGS_TEC_45 LGS_TEC LGS_TEC_45 SE_TEC SE_TEC_45 NGS_SKY LGS_SKY SE_SKY *(NGS_TEC)*	AO tracking
INS.CAL.NAME	no	OFF PPL FPN_EXT FPL_EXT FPN_DLNIR FPL_DLNIR *(FPN_DLNIR)*	CU configuration
INS.LAMPS.NAME	no	OFF LDLS_ON QTH_ON NEON_ON ARGO_ON XENO_ON KRIP_ON LDLS_MAG8 LDLS_MAG9 LDLS_MAG10 LDLS_MAG12 LDLS_MAG14 LDLS_MAG16 LDLS_MAG20 *(LDLS_MAG10)*	Lamps configuration
SEQ.AO.NDIT	no	1..10000 *(1000)*	Number of detector integration time
SEQ.CAMERA_GAIN	no	1..400 *(1)*	Camera gain
SEQ.CHK_LO	no	T F *(F)*	Check LO channel
SEQ.INSTALL_CFG	no	T F *(F)*	Install configuration
SEQ.INTERACTIVE	no	T F *(F)*	Interactive
SEQ.NO_SETUP	no	T F *(F)*	Avoid applying ICS setup
SEQ.STOP_LAMPS	no	T F *(T)*	Switch LAMPS off after measurement
SEQ.STOP_PIPELINE	no	T F *(T)*	Stop SPARTA pipeline after measurement
SEQ.SUBAPS.THRESHOLD	no	0..1 *(0.1)*	Illumination threshold
SEQ.XPOS.LIST	yes	0..10 *(-1 0 0 0 1)*	list of X positions
SEQ.YPOS.LIST	yes	0..10 *(0 -1 0 1 0)*	list of Y positions
Fixed values:			
Parameter	Hidden	Value	Label

5.3.26 ERIS_ao_tec_NGS_CUSTAGES

TO BE WRITTEN

ERIS_ao_tec_NGS_CUSTAGES.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
INS.AO.NAME	no	NGS_ONAXIS_CU LO_ONAXIS_CU LGS_ONAXIS_CU SAFE NGS_OPEN LGS_OPEN NGS_SKY SE_SKY LGS_SKY *(NGS_ONAXIS_CU)*	AO configuration
INS.AOTRACK.NAME	no	NGS_TEC NGS_TEC_45 LGS_TEC LGS_TEC_45 SE_TEC SE_TEC_45 NGS_SKY LGS_SKY SE_SKY *(NGS_TEC)*	AO tracking
INS.CAL.NAME	no	OFF PPL FPN_EXT FPL_EXT FPN_DLNIR FPL_DLNIR *(FPN_DLNIR)*	CU configuration
INS.LAMPS.NAME	no	OFF LDLS_ON QTH_ON NEON_ON ARGO_ON XENO_ON KRIP_ON LDLS_MAG8 LDLS_MAG9 LDLS_MAG10 LDLS_MAG12 LDLS_MAG14 LDLS_MAG16 LDLS_MAG20 *(LDLS_MAG16)*	Lamps configuration
INS.NXAW.NAME	no	Crosshairs Pinholes Slit Small Dark1 Large Vortex-L Vortex-M *(Small)*	NIX aperture wheel, need to match NXCW, NIX.OPTI2
INS.NXCW.NAME	no	13mas-JHK 27mas-JHK 13mas-LM 13mas-LSS *(13mas-JHK)*	NIX camera wheel

INS.NXDF.NAME	no	E-cam1-S E-cam2-S E-cam3-S E-cam1-D E-cam2-D E-cam3-D E-APP-JHK E-APP-LM E-Vortex E-LSS I-cam1-S I-cam2-S I-cam3-S I-cam1-D I-cam2-D I-cam3-D Pupil-K-S Pupil-K-D Pupil-L-S Pupil-L-D *(E-cam1-S)*	NIX detector focus
INS.NXFW.NAME	no	Open1 IB-2.48 IB-2.42 Br-a-cont Br-a Br-g L-Broad Mp Short-Lp Lp Dark1 J H Ks Pa-b Fe-II H2-cont H2-1-0S K-peak Dark2 *(Br-g)*	NIX filter wheel
INS.NXIS.NAME	no	27mas-JHK Dark1 13mas-JHK 13mas-LM Dark2 Pupil 13mas-LSS APP-JHK APP-LM Vortex Dark3 *(13mas-JHK)*	NIX plate scale. Must match the camera wheel NXCW
INS.NXPW.NAME	no	Crosshairs Dark3 Dark4 Dark5 Open1 Lyot-ND ND Lyot Spider LM-pupil Dark1 JHK-pupil Blocking APP Grism SAM-7 SAM-9 SAM-23 Open Dark2 *(JHK-pupil)*	NIX pupil wheel
SEQ.AO.NDIT	no	1..10000 *(1000)*	Number of detector integration time
SEQ.CAMERA_GAIN	no	1..400 *(1)*	Camera gain
SEQ.CLOSE_PUPLOOP	no	T F *(T)*	Close pupil loop
SEQ.INSTALL_CFG	no	T F *(F)*	Install configuration
SEQ.INTERACTIVE	no	T F *(F)*	Interactive
SEQ.NO_SETUP	no	T F *(F)*	Avoid applying ICS setup
SEQ.REMOVETT	no	T F *(T)*	Remove Tip/Tilt
SEQ.STOP_LAMPS	no	T F *(T)*	Switch LAMPS off after measurement
SEQ.STOP_PIPELINE	no	T F *(T)*	Stop SPARTA pipeline after measurement
SEQ.SUBAPS.THRESHOLD	no	0..1 *(0.1)*	Illumination threshold
SEQ.XPOS.LIST	yes	0..10 *(-1 0 0 0 1)*	list of X positions
SEQ.YPOS.LIST	yes	0..10 *(0 -1 0 1 0)*	list of Y positions
Fixed values:			
Parameter	Hidden	Value	Label

5.3.27 ERIS_ao_tec_NGS_CUtiptiltIM

This template measures the Interaction Matrix between the PHMX and Y movements and the AO tip-tilt signal on the NGS wavefront sensor. After the measurement, it generates and saves a 2x2 reconstructor matrix which can be used to adjust the PHMX/Y position based on the AO tip-tilt signal.

This matrix is intended to be used during the execution of the differential flexures and NCPA templates.

ERIS_ao_tec_NGS_CUtiptiltIM.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
INS.AO.NAME	no	NGS_ONAXIS_CU LO_ONAXIS_CU LGS_ONAXIS_CU SAFE NGS_OPEN LGS_OPEN NGS_SKY SE_SKY LGS_SKY *(NGS_ONAXIS_CU)*	AO configuration
INS.AOTRACK.NAME	no	NGS_TEC NGS_TEC_45 LGS_TEC LGS_TEC_45 SE_TEC SE_TEC_45 NGS_SKY LGS_SKY SE_SKY *(NGS_TEC)*	AO tracking
INS.CAL.NAME	no	OFF PPL FPN_EXT FPL_EXT FPN_DLNIR FPL_DLNIR *(FPN_DLNIR)*	CU configuration
INS.LAMPS.NAME	no	OFF LDLS_ON QTH_ON NEON_ON ARGO_ON XENO_ON KRIP_ON LDLS_MAG8 LDLS_MAG9 LDLS_MAG10 LDLS_MAG12 LDLS_MAG14 LDLS_MAG16 LDLS_MAG20 *(LDLS_MAG10)*	Lamps configuration
SEQ.AO.NDIT	no	1..10000 *(1000)*	Number of detector integration time
SEQ.CAMERA_GAIN	no	1..400 *(1)*	Camera gain
SEQ.CHK_NIX	no	T F *(F)*	Check NIX
SEQ.CHK_SPIFFIER	no	T F *(F)*	Check SPIFFIER
SEQ.INSTALL_CFG	no	T F *(F)*	Install configuration
SEQ.INTERACTIVE	no	T F *(F)*	Interactive
SEQ.NO_SETUP	no	T F *(F)*	Avoid applying ICS setup
SEQ.STOP_LAMPS	no	T F *(T)*	Switch LAMPS off after measurement
SEQ.STOP_PIPELINE	no	T F *(T)*	Stop SPARTA pipeline after measurement
SEQ.SUBAPS.THRESHOLD	no	0..1 *(0.1)*	Illumination threshold
SEQ.XPOS.LIST	yes	0..10 *(-1 0 0 0 1)*	list of X positions

SEQ.YPOS.LIST	yes	0..10 *(0 -1 0 1 0)*	list of Y positions
Fixed values:			
Parameter	Hidden	Value	Label

5.3.28 ERIS_ao_tec_NGSAcDark

This template measures and stores on disk a series of dark frames for the Acquisition Camera, that will be used during the AO acquisition sequence. The list of DIT and binning configuration is automatically determined scanning the AO configuration tables, and a dark frame for each possible configuration will be stored.

ERIS_ao_tec_NGSAcDark.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
SEQ.INSTALL_CFG	no	T F *(F)*	Install configuration
SEQ.INTERACTIVE	no	T F *(F)*	Interactive
SEQ.TDCS_OFF	no	T F *(T)*	Turn off TDCS
Fixed values:			
Parameter	Hidden	Value	Label
DPR.CATG	no	CALIB	Data product category
DPR.TECH	no	IMAGE	Data product technique
DPR.TYPE	no	DARK	Data product type

5.3.29 ERIS_ao_tec_NGSAdcShWobble

This template measures the PSF offset introduced by the ADC movement in the NGS wavefront sensor. The ADC is moved in steps, keeping the dispersion amount at zero and varying the dispersion angle. At each step, a series of slope frames are saved from SPARTA using the loop recorder. After measurement, it generates and saves a LUT that will will be used to compensate the PSF offset during observations.

ERIS_ao_tec_NGSAdcShWobble.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
INS.AO.NAME	no	NGS_ONAXIS_CU LO_ONAXIS_CU LGS_ONAXIS_CU SAFE NGS_OPEN LGS_OPEN NGS_SKY SE_SKY LGS_SKY *(NGS_ONAXIS_CU)*	AO configuration
INS.AOTRACK.NAME	no	NGS_TEC NGS_TEC_45 LGS_TEC LGS_TEC_45 SE_TEC SE_TEC_45 NGS_SKY LGS_SKY SE_SKY *(NGS_TEC)*	AO tracking
INS.CAL.NAME	no	OFF PPL FPN_EXT FPL_EXT FPN_DLNIR FPL_DLNIR *(FPN_DLNIR)*	CU configuration
INS.LAMPS.NAME	no	OFF LDLS_ON QTH_ON NEON_ON ARGO_ON XENO_ON KRIP_ON LDLS_MAG8 LDLS_MAG9 LDLS_MAG10 LDLS_MAG12 LDLS_MAG14 LDLS_MAG16 LDLS_MAG20 *(LDLS_MAG10)*	Lamps configuration
SEQ.ANGLE.END	no	0..720 *(360)*	Stop angle
SEQ.ANGLE.START	no	0..360 *(0)*	Start angle
SEQ.ANGLE.STEP	no	1..180 *(30)*	Angle step
SEQ.AO.NDIT	no	1..10000 *(1000)*	Number of detector integration time
SEQ.CAMERA_GAIN	no	1..400 *(1)*	Camera gain
SEQ.CHK_NGS	no	T F *(F)*	Check NGS
SEQ.CLOSE_LUTLOOP	no	T F *(F)*	Close LUT loop
SEQ.CLOSE_PUPLOOP	no	T F *(F)*	Close pupil loop
SEQ.DELAY	no	0..1000 *(0)*	Delay between steps
SEQ.INSTALL_CFG	no	T F *(F)*	Install configuration
SEQ.INTERACTIVE	no	T F *(F)*	Interactive
SEQ.ITERATIONS	no	1..1800 *(1)*	Iterations
SEQ.NO_SETUP	no	T F *(F)*	Avoid applying ICS setup
SEQ.PUP.THRESHOLD	no	0..1e9 *(10)*	Pupil motion threshold
SEQ.REMOVETT	no	T F *(F)*	Remove Tip/Tilt
SEQ.STOP_LAMPS	no	T F *(T)*	Switch LAMPS off after measurement
SEQ.STOP_PIPELINE	no	T F *(T)*	Stop SPARTA pipeline after measurement
SEQ.SUBAPS.THRESHOLD	no	0..1 *(0.1)*	Illumination threshold
SEQ.THRESHOLD	no	0..1e9 *(0)*	Threshold
Fixed values:			
Parameter	Hidden	Value	Label
SEQ.R2_THRESHOLD	no	1e9	R2 threshold

5.3.30 ERIS_ao_tec_NGSCcdDark

Measure a series of dark frames on the NGS WFS camera, one for each possible DIT. Dark frames are stored on disk and will be used in the AO acquisition sequence. The list of possible DITs is automatically determined scanning the AO configuration tables.

ERIS_ao_tec_NGSCcdDark.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
SEQ.AO.NDIT	no	1..10000 *(1000)*	Number of detector integration time
SEQ.STOP_PIPELINE	no	T F *(T)*	Stop SPARTA pipeline after measurement
Fixed values:			
Parameter	Hidden	Value	Label

5.3.31 ERIS_ao_tec_NGSCcdGain

This template measures the ADU/electron ratio of the NGS wavefront sensor. After setting the specified CU configuration and camera gains, it iterates over a series of NGS framerates, saving a series of pixel frames at each point using the SPARTA pixel recorder. At the end, a data analysis routine computes the ADU/electron ratio for each of the 8 CCD quadrants.

ERIS_ao_tec_NGSCcdGain.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
INS.AO.NAME	no	NGS_ONAXIS_CU LO_ONAXIS_CU LGS_ONAXIS_CU SAFE NGS_OPEN LGS_OPEN NGS_SKY SE_SKY LGS_SKY *(NGS_ONAXIS_CU)*	AO configuration
INS.AOTRACK.NAME	no	NGS_TEC NGS_TEC_45 LGS_TEC LGS_TEC_45 SE_TEC SE_TEC_45 NGS_SKY LGS_SKY SE_SKY *(NGS_TEC)*	AO tracking
INS.CAL.NAME	no	OFF PPL FPN_EXT FPL_EXT FPN_DLNIR FPL_DLNIR *(FPN_DLNIR)*	CU configuration
INS.LAMPS.NAME	no	OFF LDLS_ON QTH_ON NEON_ON ARGO_ON XENO_ON KRIP_ON LDLS_MAG8 LDLS_MAG9 LDLS_MAG10 LDLS_MAG12 LDLS_MAG14 LDLS_MAG16 LDLS_MAG20 *(QTH_ON)*	Lamps configuration
SEQ.AO.NDIT	no	1..10000 *(1000)*	Number of detector integration time
SEQ.CAMERA_FRAMERATE	no	1..1000 *(1000 500)*	Camera framerate in Hz
SEQ.CAMERA_GAIN	no	1..400 *(1)*	Camera gain
SEQ.INTERACTIVE	no	T F *(F)*	Interactive
SEQ.NO_SETUP	no	T F *(F)*	Avoid applying ICS setup
SEQ.STOP_LAMPS	no	T F *(T)*	Switch LAMPS off after measurement
SEQ.STOP_PIPELINE	no	T F *(T)*	Stop SPARTA pipeline after measurement
SEQ.THRESHOLD	no	0..1e9 *(0.3)*	Threshold
Fixed values:			
Parameter	Hidden	Value	Label

5.3.32 ERIS_ao_tec_NGSCcdRon

This template measures the Read-Out Noise of the NGS wavefront sensor. The measurement is performed at the specified camera EM gain. blocking the light by setting the NGFW in BLOCK position and using the SPARTA pixel recorder to read a series of pixel frames. Data is processed in order to calculate an average standard deviation value, which is then converted into electrons and saved into FITS logs.

ERIS_ao_tec_NGSCcdRon.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
INS.NGSW.NAME	no	LO HO *(HO)*	NGS Lenslet switch
SEQ.AO.NDIT	no	1..10000 *(1000)*	Number of detector integration time
SEQ.CAMERA_GAIN	no	1..400 *(1)*	Camera gain
SEQ.MOTORS	no	T F *(F)*	Turn on motors
SEQ.NO_SETUP	no	T F *(T)*	Avoid applying ICS setup
SEQ.RON_THRESHOLD	no	0..1e9 *(0.5)*	Threshold
SEQ.STOP_PIPELINE	no	T F *(T)*	Stop SPARTA pipeline after measurement
Fixed values:			
Parameter	Hidden	Value	Label

5.3.33 ERIS_ao_tec_NGSCheckPupil

This template performs an NGS pupil check of the AO system already in closed loop. It does NOT setup any configuration. It gets the list of VALID subaps from SPARTA and verifies that exactly all VALID subaps are well illuminated.

ERIS_ao_tec_NGSCheckPupil.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
SEQ.AO.NDIT	no	1..10000 *(100)*	Number of detector integration time
SEQ.SUBAPS.THRESHOLD	no	0..1 *(0.1)*	Illumination threshold
Fixed values:			
Parameter	Hidden	Value	Label
SEQ.CHK_LGS	no	T	Check LGS
SEQ.CHK_NGS	no	F	Check NGS

5.3.34 ERIS_ao_tec_NGSFieldStop

Checks the NGS field vignetting, moving the CU source or the NGFP stages (depending on the SEQ.CU parameter) in steps across the field of view on a grid. A linear motion on a single axis can be obtained setting the START and STOP values to the same value for the other axis. At each grid point, a series of pixel frames are read and averaged form the NGS detector using the SPARTA pixel recorder.

ERIS_ao_tec_NGSFieldStop.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
INS.AO.NAME	no	NGS_ONAXIS_CU LO_ONAXIS_CU LGS_ONAXIS_CU SAFE NGS_OPEN LGS_OPEN NGS_SKY SE_SKY LGS_SKY *(NGS_ONAXIS_CU)*	AO configuration
INS.AOTRACK.NAME	no	NGS_TEC NGS_TEC_45 LGS_TEC LGS_TEC_45 SE_TEC SE_TEC_45 NGS_SKY LGS_SKY SE_SKY *(NGS_TEC)*	AO tracking
INS.CAL.NAME	no	OFF PPL FPN_EXT FPL_EXT FPN_DLNIR FPL_DLNIR *(FPN_DLNIR)*	CU configuration
INS.LAMPS.NAME	no	OFF LDLS_ON QTH_ON NEON_ON ARGO_ON XENO_ON KRIP_ON LDLS_MAG8 LDLS_MAG9 LDLS_MAG10 LDLS_MAG12 LDLS_MAG14 LDLS_MAG16 LDLS_MAG20 *(LDLS_MAG10)*	Lamps configuration
SEQ.AO.NDIT	no	1..10000 *(1000)*	Number of detector integration time
SEQ.CAMERA_GAIN	no	1..400 *(1)*	Camera gain
SEQ.CHK_LO	no	T F *(F)*	Check LO channel
SEQ.CLOSE_PUPLOOP	no	T F *(F)*	Close pupil loop
SEQ.CU	no	T F *(F)*	Use CU
SEQ.NO_SETUP	no	T F *(F)*	Avoid applying ICS setup
SEQ.STOP_LAMPS	no	T F *(T)*	Switch LAMPS off after measurement
SEQ.STOP_PIPELINE	no	T F *(T)*	Stop SPARTA pipeline after measurement
SEQ.SUBAPS.THRESHOLD	no	0..1 *(0.1)*	Illumination threshold
SEQ.XPOS.START	no	-100..100 *(-1)*	X scan start position
SEQ.XPOS.STEP	no	0..100 *(1)*	X scan step
SEQ.XPOS.STOP	no	-100..100 *(1)*	X scan stop position
SEQ.YPOS.START	no	-100..100 *(-1)*	Y scan start position
SEQ.YPOS.STEP	no	0..100 *(1)*	Y scan step
SEQ.YPOS.STOP	no	-100..100 *(1)*	Y scan stop position
Fixed values:			
Parameter	Hidden	Value	Label

5.3.35 ERIS_ao_tec_NGSFocus

Measures NGS focus stage position that maximizes the PSF strehl ratio on NIX or SPIFFIER. The measurement in closed loop, acquiring a series of PSFs from NIX or SPIFFIER, moving the NGS focus stage in steps over a configurable range. After the acquisition, the best focus position is identified and optionally saved on disk as the reference focus position for NGS mode.

This template is intended to be run in closed loop, therefore it does not perform any INS or SPARTA setup.

ERIS_ao_tec_NGSFocus.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
DET.DIT	no	0.0..1800.0 *(-)*	Detector integration time
DET.NDIT	no	1..31775 *(-)*	Number of detector integrations
DET.READOUT	no	SLOW_GR_UTR FAST_UNCORR *(SLOW_GR_UTR)*	Detector readout mode
DET.WIN.NX	no	2048 *(2048)*	Window Size in X
DET.WIN.NY	no	64 128 256 384 512 768 1024 2048 *(2048)*	Window Size in Y
DET.WIN.STARTX	no	1..2048 *(1)*	First column of window
DET.WIN.STARTY	no	1..2048 *(1)*	First row of window
INS.NXCW.NAME	no	13mas-JHK 27mas-JHK 13mas-LM 13mas-LSS *(13mas-JHK)*	NIX camera wheel
INS.NXFW.NAME	no	Open1 IB-2.48 IB-2.42 Br-a-cont Br-a Br-g L-Broad Mp Short-Lp Lp Dark1 J H Ks Pa-b Fe-II H2-cont H2-1-0S K-peak Dark2 *(Fe-II)*	NIX filter wheel
INS.NXPW.NAME	no	Crosshairs Dark3 Dark4 Dark5 Open1 Lyot-ND ND Lyot Spider LM-pupil Dark1 JHK-pupil Blocking APP Grism SAM-7 SAM-9 SAM-23 Open Dark2 *(JHK-pupil)*	NIX pupil wheel
INS.SPFW.NAME	no	Closed1 K_new 3D_K_1 H+K_new H+K_1 Closed2 J_short J_middle J_long J_new Closed3 H_short H_middle H_long H_middle_long H_new Closed4 Open *(J_new)*	Filter wheel position
INS.SPGW.NAME	no	J_low H_low K_low J_short J_middle J_long H_short H_middle H_long K_short K_middle K_long *(J_low)*	Grating wheel position
INS.SPXW.NAME	no	25mas 100mas 250mas *(25mas)*	SPIFFIER spaxel size
SEQ.CHK_NIX	no	T F *(T)*	Check NIX
SEQ.CHK_SPIFFIER	no	T F *(T)*	Check SPIFFIER
SEQ.CUBE.PERS	no	F T *(F)*	Store Data Cube for persistence? (T/F)
SEQ.FOCUS.START	no	0..100 *(10)*	Focus scan start position
SEQ.FOCUS.STEP	no	0..100 *(0.2)*	Focus scan step
SEQ.FOCUS.STOP	no	0..100 *(12)*	Focus scan stop position
SEQ.INSTALL_CFG	no	T F *(F)*	Install configuration
SEQ.INTERACTIVE	no	T F *(F)*	Interactive
SEQ.WSIZE	no	2..2048 *(100)*	Window size
Fixed values:			
Parameter	Hidden	Value	Label
DPR.CATG	no	TECHNICAL	Data product category
DPR.TECH	no	IMAGE	Data product technique
DPR.TYPE	no	FOCUS	Data product type
SEQ.CHK_LGS	no	F	Check LGS
SEQ.CHK_LO	no	F	Check LO channel
SEQ.CHK_NGS	no	T	Check NGS

5.3.36 ERIS_ao_tec_NGSNGCGain

This template measures the gain of the NGS wavefront sensor by executing the ESO NGC Exposure Driver Tool.

ERIS_ao_tec_NGSNGCGain.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
INS.AO.NAME	no	NGS_ONAXIS_CU LO_ONAXIS_CU LGS_ONAXIS_CU SAFE NGS_OPEN LGS_OPEN NGS_SKY SE_SKY LGS_SKY *(NGS_ONAXIS_CU)*	AO configuration
INS.AOTRACK.NAME	no	NGS_TEC NGS_TEC_45 LGS_TEC LGS_TEC_45 SE_TEC SE_TEC_45 NGS_SKY LGS_SKY SE_SKY *(NGS_TEC)*	AO tracking
INS.CAL.NAME	no	OFF PPL FPN_EXT FPL_EXT FPN_DLNIR FPL_DLNIR *(FPN_DLNIR)*	CU configuration

INS.LAMPS.NAME	no	OFF LDLS_ON QTH_ON NEON_ON ARGO_ON XENO_ON KRIP_ON LDLS_MAG8 LDLS_MAG9 LDLS_MAG10 LDLS_MAG12 LDLS_MAG14 LDLS_MAG16 LDLS_MAG20 *(LDLS_MAG10)*	Lamps configuration
SEQ.CAMERA_FRAMERATE	no	1..1000 *(1000)*	Camera framerate in Hz
SEQ.CAMERA_GAIN	no	1..400 *(1)*	Camera gain
SEQ.NO_SETUP	no	T F *(F)*	Avoid applying ICS setup
SEQ.STOP_LAMPS	no	T F *(T)*	Switch LAMPS off after measurement
SEQ.STOP_PIPELINE	no	T F *(T)*	Stop SPARTA pipeline after measurement
Fixed values:			
Parameter	Hidden	Value	Label

5.3.37 ERIS_ao_tec_NGSPmPsf

Calibrates the NGS pupil and PSF position displacement due to the NGPM movement. After the calibration, generates and saves a 2x2 reconstructor matrix which can be used to adjust the NPGM position based on the current pupil position. This reconstructor is used by the auxiliary loop SL2 to center the LGS pupil on the LGS detector. The PSF position information is instead used to build a LUT that will will be used to compensate the PSF offset during observations.

ERIS_ao_tec_NGSPmPsf.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
INS.AO.NAME	no	NGS_ONAXIS_CU LO_ONAXIS_CU LGS_ONAXIS_CU SAFE NGS_OPEN LGS_OPEN NGS_SKY SE_SKY LGS_SKY *(NGS_ONAXIS_CU)*	AO configuration
INS.AOTRACK.NAME	no	NGS_TEC NGS_TEC_45 LGS_TEC LGS_TEC_45 SE_TEC SE_TEC_45 NGS_SKY LGS_SKY SE_SKY *(NGS_TEC)*	AO tracking
INS.CAL.NAME	no	OFF PPL FPN_EXT FPL_EXT FPN_DLNIR FPL_DLNIR *(FPN_DLNIR)*	CU configuration
INS.LAMPS.NAME	no	OFF LDLS_ON QTH_ON NEON_ON ARGO_ON XENO_ON KRIP_ON LDLS_MAG8 LDLS_MAG9 LDLS_MAG10 LDLS_MAG12 LDLS_MAG14 LDLS_MAG16 LDLS_MAG20 *(LDLS_MAG10)*	Lamps configuration
SEQ.AO.NDIT	no	1..10000 *(1000)*	Number of detector integration time
SEQ.CAMERA_GAIN	no	1..400 *(1)*	Camera gain
SEQ.CHK_NGS	no	T F *(F)*	Check NGS
SEQ.DELAY	no	0..1000 *(0)*	Delay between steps
SEQ.INSTALL_CFG	no	T F *(F)*	Install configuration
SEQ.INTERACTIVE	no	T F *(F)*	Interactive
SEQ.NO_SETUP	no	T F *(F)*	Avoid applying ICS setup
SEQ.STOP_LAMPS	no	T F *(T)*	Switch LAMPS off after measurement
SEQ.STOP_PIPELINE	no	T F *(T)*	Stop SPARTA pipeline after measurement
SEQ.SUBAPS.THRESHOLD	no	0..1 *(0.1)*	Illumination threshold
SEQ.THRESHOLD	no	0..1e9 *(0)*	Threshold
SEQ.XPOS.LIST	yes	0..10 *(4 5 5 5 6)*	list of X positions
SEQ.YPOS.LIST	yes	0..10 *(5 4 5 6 4)*	list of Y positions
Fixed values:			
Parameter	Hidden	Value	Label

5.3.38 ERIS_ao_tec_NGSRefSlopes

This templates measures and stores the NGS WFS reference slopes.

ERIS_ao_tec_NGSRefSlopes.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
INS.AO.NAME	no	NGS_ONAXIS_CU LO_ONAXIS_CU LGS_ONAXIS_CU SAFE NGS_OPEN LGS_OPEN NGS_SKY SE_SKY LGS_SKY *(NGS_ONAXIS_CU)*	AO configuration

INS.AOTRACK.NAME	no	NGS_TEC NGS_TEC_45 LGS_TEC LGS_TEC_45 SE_TEC SE_TEC_45 NGS_SKY LGS_SKY SE_SKY *(NGS_TEC)*	AO tracking
INS.CAL.NAME	no	OFF PPL FPN_EXT FPL_EXT FPN_DLNIR FPL_DLNIR *(FPN_DLNIR)*	CU configuration
INS.LAMPS.NAME	no	OFF LDLS_ON QTH_ON NEON_ON ARGO_ON XENO_ON KRIP_ON LDLS_MAG8 LDLS_MAG9 LDLS_MAG10 LDLS_MAG12 LDLS_MAG14 LDLS_MAG16 LDLS_MAG20 *(LDLS_MAG10)*	Lamps configuration
SEQ.ANGLE.END	no	0..720 *(360)*	Stop angle
SEQ.ANGLE.START	no	0..360 *(0)*	Start angle
SEQ.ANGLE.STEP	no	1..180 *(30)*	Angle step
SEQ.AO.NDIT	no	1..10000 *(1000)*	Number of detector integration time
SEQ.CAMERA_GAIN	no	1..400 *(1)*	Camera gain
SEQ.CLOSE_PUPLOOP	no	T F *(F)*	Close pupil loop
SEQ.DELAY	no	0..1000 *(0)*	Delay between steps
SEQ.INSTALL_CFG	no	T F *(F)*	Install configuration
SEQ.INTERACTIVE	no	T F *(F)*	Interactive
SEQ.ITERATIONS	no	1..1800 *(1)*	Iterations
SEQ.NO_SETUP	no	T F *(F)*	Avoid applying ICS setup
SEQ.STOP_LAMPS	no	T F *(T)*	Switch LAMPS off after measurement
SEQ.STOP_PIPELINE	no	T F *(T)*	Stop SPARTA pipeline after measurement
SEQ.SUBAPS.THRESHOLD	no	0..1 *(0.5)*	Illumination threshold
SEQ.THRESHOLD	no	0..1e9 *(0.8)*	Threshold
Fixed values:			
Parameter	Hidden	Value	Label

5.3.39 ERIS_ao_tec_NGSRotShWobble

This template measures the PSF and pupil offset introduced by the NGRT movement in the NGS wavefront sensor.

The NGRT is moved in steps, and at each step a series of slope frames are saved from SPARTA using the loop recorder. After measurement, it generates and saves a LUT that will will be used to compensate the PSF offset during observations.

Optionally, the template can close the auxiliary loop for pupil compensation. In this case, the pupil offset cannot be measured, and the NGPM command that is executing the pupil compensation is reported instead.

The template can also close the PSF compensation loop. In this case, the measurement output is the residual error after the LUT application.

ERIS_ao_tec_NGSRotShWobble.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
INS.AO.NAME	no	NGS_ONAXIS_CU LO_ONAXIS_CU LGS_ONAXIS_CU SAFE NGS_OPEN LGS_OPEN NGS_SKY SE_SKY LGS_SKY *(NGS_ONAXIS_CU)*	AO configuration
INS.AOTRACK.NAME	no	NGS_TEC NGS_TEC_45 LGS_TEC LGS_TEC_45 SE_TEC SE_TEC_45 NGS_SKY LGS_SKY SE_SKY *(NGS_TEC)*	AO tracking
INS.CAL.NAME	no	OFF PPL FPN_EXT FPL_EXT FPN_DLNIR FPL_DLNIR *(FPN_DLNIR)*	CU configuration
INS.LAMPS.NAME	no	OFF LDLS_ON QTH_ON NEON_ON ARGO_ON XENO_ON KRIP_ON LDLS_MAG8 LDLS_MAG9 LDLS_MAG10 LDLS_MAG12 LDLS_MAG14 LDLS_MAG16 LDLS_MAG20 *(LDLS_MAG10)*	Lamps configuration
SEQ.ANGLE.END	no	0..720 *(360)*	Stop angle
SEQ.ANGLE.START	no	0..360 *(0)*	Start angle
SEQ.ANGLE.STEP	no	1..180 *(30)*	Angle step
SEQ.AO.NDIT	no	1..10000 *(1000)*	Number of detector integration time
SEQ.CAMERA_GAIN	no	1..400 *(1)*	Camera gain
SEQ.CHK_NGS	no	T F *(F)*	Check NGS

SEQ.CLOSE_LUTLOOP	no	T F *(F)*	Close LUT loop
SEQ.CLOSE_PUPLOOP	no	T F *(F)*	Close pupil loop
SEQ.DELAY	no	0..1000 *(0)*	Delay between steps
SEQ.INSTALL_CFG	no	T F *(F)*	Install configuration
SEQ.INTERACTIVE	no	T F *(F)*	Interactive
SEQ.ITERATIONS	no	1..1800 *(1)*	Iterations
SEQ.NO_SETUP	no	T F *(F)*	Avoid applying ICS setup
SEQ.PUP.THRESHOLD	no	0..1e9 *(10)*	Pupil motion threshold
SEQ.R2_THRESHOLD	no	0..1e9 *(0.05)*	R2 threshold
SEQ.REMOVETT	no	T F *(T)*	Remove Tip/Tilt
SEQ.STOP_LAMPS	no	T F *(T)*	Switch LAMPS off after measurement
SEQ.STOP_PIPELINE	no	T F *(T)*	Stop SPARTA pipeline after measurement
SEQ.SUBAPS.THRESHOLD	no	0..1 *(0.1)*	Illumination threshold
SEQ.THRESHOLD	no	0..1e9 *(0)*	Threshold
Fixed values:			
Parameter	Hidden	Value	Label

5.3.40 ERIS_ao_tec_NGSWFSHOLORepeatability

The template is used to measure the NGS WFS HO/LO stage repeatability. The CU source is kept fixed throughout this test. The source is acquired on NGS WFS through the usage either of NGS_ONAXIS_CU assembly to test HO position, and LO_ONAXIS_CU to test the LO one, and centered in the WFS (until Tip, Tilt and focus signal is null). NGS WFS is set up for both HO and LO mode. Due to the high overhead of switching the NGS camera from HO to LO mode and vice versa (requiring a SPARTA reconfiguration that takes a few minutes), the measurement is performed separately for the HO and the LO positions. Two sets of Tip, Tilt and Focus error values measured by the NGS WFS are stored.

The switch is repeatedly flipped between HO and LO positions, and each time it is in HO, a set of Tip, Tilt and Focus values are stored.

The procedure is then repeated setting the NGS camera in LO mode, flipping the switch and measuring the Tip, Tilt and Focus values each time it reaches the LO position. The template finally checks that all the collected Tip/Tilt/Focus (i.e. TTF) error values are within a pre-defined threshold.

ERIS_ao_tec_NGSWFSHOLORepeatability.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
INS.AO.NAME	no	NGS_ONAXIS_CU LO_ONAXIS_CU LGS_ONAXIS_CU SAFE NGS_OPEN LGS_OPEN NGS_SKY SE_SKY LGS_SKY *(NGS_ONAXIS_CU)*	AO configuration
INS.AOTRACK.NAME	no	NGS_TEC NGS_TEC_45 LGS_TEC LGS_TEC_45 SE_TEC SE_TEC_45 NGS_SKY LGS_SKY SE_SKY *(NGS_TEC)*	AO tracking
INS.CAL.NAME	no	OFF PPL FPN_EXT FPL_EXT FPN_DLNIR FPL_DLNIR *(FPN_EXT)*	CU configuration
INS.LAMPS.NAME	no	OFF LDLS_ON QTH_ON NEON_ON ARGO_ON XENO_ON KRIP_ON LDLS_MAG8 LDLS_MAG9 LDLS_MAG10 LDLS_MAG12 LDLS_MAG14 LDLS_MAG16 LDLS_MAG20 *(LDLS_MAG8)*	Lamps configuration
SEQ.AO.NDIT	no	1..10000 *(1000)*	Number of detector integration time
SEQ.CAMERA_GAIN	no	1..400 *(1)*	Camera gain
SEQ.CHK_LO	no	T F *(F)*	Check LO channel
SEQ.CLOSE_PUPLOOP	no	T F *(F)*	Close pupil loop
SEQ.DELAY	no	0..1000 *(0)*	Delay between steps
SEQ.NO_SETUP	no	T F *(F)*	Avoid applying ICS setup
SEQ.REMOVETT	no	T F *(T)*	Remove Tip/Tilt
SEQ.STOP_LAMPS	no	T F *(T)*	Switch LAMPS off after measurement
SEQ.STOP_PIPELINE	no	T F *(T)*	Stop SPARTA pipeline after measurement
SEQ.SUBAPS.THRESHOLD	no	0..1 *(0.1)*	Illumination threshold
SEQ.THRESHOLD	no	0..1e9 *(100)*	Threshold
SEQ.XPOS.LIST	yes	0..10 *(0 0)*	list of X positions
Fixed values:			
Parameter	Hidden	Value	Label

5.3.41 ERIS_ao_tec_NGSWFSStagesRepeatability

The template is used to measure the stages repeatability in positioning the WFS board in the field patrol (x,y, X-stage + periscope) for the NGS acquisition and focus (z, focus-stage). The CU source is kept fixed throughout this test. The source is acquired on NGS WFS through the usage of NGS_ONAXIS_CU assembly and centered in the WFS (until Tip, Tilt and focus signal is null). The initial optimal positions of the the stage is then recorded. In this initial optimal conditions a loop recording is started and a FITS file with a complete header is saved. The initial values are added to the header. The repeatability measurement is then started and, at every iteration of the measurement, the i-index positions of the out-movements lists passed as template parameter is setup for the stages. At the end of each iteration (back to initial position), a loop recorder is started and a FITS file with a complete header is saved so that the Zernike Tip, Tilt and Focus repositioning error are stored in the header The template finally checks that all the collected Tip/Tilt/Focus (i.e. TTF) error values are within a pre-defined threshold.

ERIS_ao_tec_NGSWFSStagesRepeatability.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
INS.AO.NAME	no	NGS_ONAXIS_CU LO_ONAXIS_CU LGS_ONAXIS_CU SAFE NGS_OPEN LGS_OPEN NGS_SKY SE_SKY LGS_SKY *(NGS_ONAXIS_CU)*	AO configuration
INS.AOTRACK.NAME	no	NGS_TEC NGS_TEC_45 LGS_TEC LGS_TEC_45 SE_TEC SE_TEC_45 NGS_SKY LGS_SKY SE_SKY *(NGS_TEC)*	AO tracking
INS.CAL.NAME	no	OFF PPL FPN_EXT FPL_EXT FPN_DLNIR FPL_DLNIR *(FPN_EXT)*	CU configuration
INS.LAMPS.NAME	no	OFF LDLS_ON QTH_ON NEON_ON ARGO_ON XENO_ON KRIP_ON LDLS_MAG8 LDLS_MAG9 LDLS_MAG10 LDLS_MAG12 LDLS_MAG14 LDLS_MAG16 LDLS_MAG20 *(LDLS_MAG8)*	Lamps configuration
SEQ.AO.NDIT	no	1..10000 *(1000)*	Number of detector integration time
SEQ.CAMERA_GAIN	no	1..400 *(1)*	Camera gain
SEQ.CLOSE_PUPLOOP	no	T F *(F)*	Close pupil loop
SEQ.DELAY	no	0..1000 *(0)*	Delay between steps
SEQ.NO_SETUP	no	T F *(F)*	Avoid applying ICS setup
SEQ.REMOVETT	no	T F *(T)*	Remove Tip/Tilt
SEQ.STOP_LAMPS	no	T F *(T)*	Switch LAMPS off after measurement
SEQ.STOP_PIPELINE	no	T F *(T)*	Stop SPARTA pipeline after measurement
SEQ.SUBAPS.THRESHOLD	no	0..1 *(0.1)*	Illumination threshold
SEQ.THRESHOLD	no	0..1e9 *(100)*	Threshold
SEQ.XPOS.LIST	yes	0..10 *(0 0)*	list of X positions
SEQ.YPOS.LIST	yes	0..10 *(0 0)*	list of Y positions
SEQ.ZPOS.LIST	yes	*(0 0)*	list of Z positions
Fixed values:			
Parameter	Hidden	Value	Label

5.3.42 ERIS_ao_tec_NixDiffFlexures

This template measures the differential mechanical flexures between the AO NGS sensor and the NIX instrument.

Using a reference CU source, a list of telescope positions (elevation and instrument rotator) is read from a configuration file, the first being a reference position (zenith and zero rotation). Before starting, a NIX dark frame is taken. At each position, telescope is preset, a NIX image is taken, and a number of NGS pixel frames are saved from the NGS HO pipeline. After all positions have been saved, data is analyzed offline in order to build a model of the flexures between AO and NIX, that will be used during night-time operation.

ERIS_ao_tec_NixDiffFlexures.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
DET.READOUT	no	SLOW_GR_UTR FAST_UNCORR *(-)*	Detector readout mode
INS.AO.NAME	no	NGS_ONAXIS_CU LO_ONAXIS_CU LGS_ONAXIS_CU SAFE NGS_OPEN LGS_OPEN NGS_SKY SE_SKY LGS_SKY *(NGS_ONAXIS_CU)*	AO configuration

INS.AOTRACK.NAME	no	NGS_TEC NGS_TEC_45 LGS_TEC LGS_TEC_45 SE_TEC SE_TEC_45 NGS_SKY LGS_SKY SE_SKY *(NGS_TEC)*	AO tracking
INS.BAND.NAME	no	J_low J_short J_middle J_long H_low H_short H_middle H_long K_low K_short K_middle K_long *(-)*	SPIFFIER grating
INS.CAL.NAME	no	OFF PPL FPN_EXT FPL_EXT FPN_DLNIR FPL_DLNIR *(FPN_DLNIR)*	CU configuration
INS.LAMPS.NAME	no	OFF LDLS_ON QTH_ON NEON_ON ARGO_ON XENO_ON KRIP_ON LDLS_MAG8 LDLS_MAG9 LDLS_MAG10 LDLS_MAG12 LDLS_MAG14 LDLS_MAG16 LDLS_MAG20 *(LDLS_MAG10)*	Lamps configuration
SEQ.ANGLE.END	no	0..720 *(360)*	Stop angle
SEQ.ANGLE.START	no	0..360 *(0)*	Start angle
SEQ.ANGLE.STEP	no	1..180 *(30)*	Angle step
SEQ.AO.NDIT	no	1..10000 *(1000)*	Number of detector integration time
SEQ.CAMERA_GAIN	no	1..400 *(1)*	Camera gain
SEQ.CLOSE_PUPLOOP	no	T F *(F)*	Close pupil loop
SEQ.ELEVATION.END	no	0..90 *(90)*	Stop elevation
SEQ.ELEVATION.START	no	0..90 *(60)*	Start elevation
SEQ.ELEVATION.STEP	no	1..90 *(10)*	Elevation step
SEQ.NIX_BACKG	no	T F *(F)*	Acquire a NIX background
SEQ.NIX_DARK	no	T F *(T)*	Acquire a NIX dark
SEQ.NO_SETUP	no	T F *(F)*	Avoid applying ICS setup
SEQ.STOP_LAMPS	no	T F *(T)*	Switch LAMPS off after measurement
SEQ.STOP_PIPELINE	no	T F *(T)*	Stop SPARTA pipeline after measurement
Fixed values:			
Parameter	Hidden	Value	Label
DPR.CATG	no	TECHNICAL	Data product category
DPR.TECH	no	IMAGE	Data product technique
DPR.TYPE	no	FLEXURE	Data product type

5.3.43 ERIS_ao_tec_NixNCPA

This template measures the Non-Common Path Aberrations between the AO NGS sensor and the NIX instrument.

The template applies a single mode as a modal offset to the AO loop, iterating over an user-defined range, and saves a NIX image at each step. Once the iteration is completed, all images are analyzed to determine the modal offset value resulting in the best PSF, and this value is saved as the reference NCPA value for that mode.

The measurement must be performed in closed loop, and separate measurements must be performed for NGS, LGS and SE AO modes.

ERIS_ao_tec_NixNCPA.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
DET.DIT	no	0.0..1800.0 *(-)*	Detector integration time
DET.NDIT	no	1..31775 *(-)*	Number of detector integrations
DET.READOUT	no	SLOW_GR_UTR FAST_UNCORR *(SLOW_GR_UTR)*	Detector readout mode
DET.WIN.NX	no	2048 *(2048)*	Window Size in X
DET.WIN.NY	no	64 128 256 384 512 768 1024 2048 *(2048)*	Window Size in Y
DET.WIN.STARTX	no	1..2048 *(1)*	First column of window
DET.WIN.STARTY	no	1..2048 *(1)*	First row of window
INS.LGSF.ZPOS	no	0.01..93.2 *(50.0)*	LGS focus stage
INS.NGSF.POS	no	0.01..20 *(10.0)*	NGS focus stage
INS.NXCW.NAME	no	13mas-JHK 27mas-JHK 13mas-LM 13mas-LSS *(13mas-JHK)*	NIX camera wheel
INS.NXFW.NAME	no	Open1 IB-2.48 IB-2.42 Br-a-cont Br-a Br-g L-Broad Mp Short-Lp Lp Dark1 J H Ks Pa-b Fe-II H2-cont H2-1-0S K-peak Dark2 *(Fe-II)*	NIX filter wheel
INS.NXPW.NAME	no	Crosshairs Dark3 Dark4 Dark5 Open1 Lyot-ND ND Lyot Spider LM-pupil Dark1 JHK-pupil Blocking APP Grism SAM-7 SAM-9 SAM-23 Open Dark2 *(JHK-pupil)*	NIX pupil wheel

SEQ.CHK_NIX	no	T F *(T)*	Check NIX
SEQ.CHK_SPIFFIER	no	T F *(F)*	Check SPIFFIER
SEQ.CUBE.PERS	no	F T *(F)*	Store Data Cube for persistence? (T/F)
SEQ.INSTALL_CFG	no	T F *(F)*	Install configuration
SEQ.INTERACTIVE	no	T F *(F)*	Interactive
SEQ.NCPA.MODE	no	1..20 *(4)*	Mode
SEQ.NCPA.START	no	-100..100 *(-100e-9)*	scan start position
SEQ.NCPA.STEP	no	0..100 *(20e-9)*	scan step
SEQ.NCPA.STOP	no	-100..100 *(100e-9)*	scan stop position
SEQ.STOP_PIPELINE	no	T F *(T)*	Stop SPARTA pipeline after measurement
SEQ.WSIZE	no	2..2048 *(100)*	Window size
Fixed values:			
Parameter	Hidden	Value	Label
DPR.CATG	no	TECHNICAL	Data product category
DPR.TECH	no	IMAGE	Data product technique
DPR.TYPE	no	PSF-CALIBRATOR,NCPA	Data product type

5.3.44 ERIS_ao_tec_QuickHealthChk

This template performs a quick health check of the AO system using the CU. In details it performs the following steps:

1. Setups a reference position for all devices through assemblies and store preliminary pupil position [subap]
2. Centers the pupil storing the piezo mirror applied delta command:
   (a) Verifies that piezo mirror delta command is within limits
   (b) Verifies that average, p2V and stdev slope signal of well illuminated subaps is within limits
3. Removes tip/til/focus (i.e. TTF removal) by using the CU stages:
   (a) Verifies that average, p2V and stdev slope signal of well illuminated subaps is within limits
   (b) Gets the list of well illuminated subaps at reference angle
   (c) Rotates the pupil by 45 deg and centers it back (to avoid K-prism wobbling) and repeat step 3 (b)
   (d) Performs an unique union of the two lists of subaps (to avoid underillumination due to CU spiders)
   (e) Gets the list of VALID subaps from SPARTA
   (f) Verifies that at least 95 % of the pupil is well illuminated
4. Setups back the reference position for all devices through assemblies and again remove TT (only TT not focus) using CU stages
5. In NGS mode, checks that current PSF on acquisition camera (i.e. TDCS) is within limits compared to reference HOTSPOT
6. Adds informations (i.e. preliminary saved pupil position, piezo applied delta command, if in NGS mode current PSF coordinates on TDCS) to the last generated FITS header
7. Sets SAFE mode, leave a clean state, and exit

ERIS_ao_tec_QuickHealthChk.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
INS.AO.NAME	no	NGS_ONAXIS_CU LO_ONAXIS_CU LGS_ONAXIS_CU SAFE NGS_OPEN LGS_OPEN NGS_SKY SE_SKY LGS_SKY *(NGS_ONAXIS_CU)*	AO configuration
INS.AOTRACK.NAME	no	NGS_TEC NGS_TEC_45 LGS_TEC LGS_TEC_45 SE_TEC SE_TEC_45 NGS_SKY LGS_SKY SE_SKY *(NGS_TEC)*	AO tracking
INS.CAL.NAME	no	OFF PPL FPN_EXT FPL_EXT FPN_DLNIR FPL_DLNIR *(FPN_DLNIR)*	CU configuration

INS.LAMPS.NAME	no	OFF LDLS_ON QTH_ON NEON_ON ARGO_ON XENO_ON KRIP_ON LDLS_MAG8 LDLS_MAG9 LDLS_MAG10 LDLS_MAG12 LDLS_MAG14 LDLS_MAG16 LDLS_MAG20 *(LDLS_MAG10)*	Lamps configuration
SEQ.AO.NDIT	no	1..10000 *(100)*	Number of detector integration time
SEQ.CAMERA_GAIN	no	1..400 *(1)*	Camera gain
SEQ.CHK_LGS	no	T F *(F)*	Check LGS
SEQ.CHK_NGS	no	T F *(T)*	Check NGS
SEQ.DELTATT_CMD.THRESHOLD	no	0..1000 *(500)*	TT mirror delta cmd threshold
SEQ.PSF_AC.THRESHOLD	no	0..200 *(100)*	AC PSF threshold
SEQ.SLOPES_AVG.THRESHOLD	no	0..200 *(100)*	Slopes AVG threshold
SEQ.SLOPES_P2V.THRESHOLD	no	0..200 *(100)*	Slopes P2V threshold
SEQ.SLOPES_STD.THRESHOLD	no	0..200 *(100)*	Slopes STD threshold
SEQ.STOP_LAMPS	no	T F *(T)*	Switch LAMPS off after measurement
SEQ.STOP_PIPELINE	no	T F *(T)*	Stop SPARTA pipeline after measurement
SEQ.SUBAPS.ABS.THRESHOLD	no	100..5000 *(1000)*	Illumination absolute threshold
SEQ.SUBAPS.THRESHOLD	no	0..1 *(0.3)*	Illumination threshold
SEQ.TTF_SLOPES_AVG.THRESHOLD	no	0..200 *(100)*	TTF slopes AVG threshold
SEQ.TTF_SLOPES_P2V.THRESHOLD	no	0..100 *(50)*	TTF slopes P2V threshold
SEQ.TTF_SLOPES_STD.THRESHOLD	no	0..100 *(50)*	TTF slopes STD threshold
Fixed values:			
Parameter	Hidden	Value	Label

5.3.45 ERIS_ao_tec_SafeWfs

This template puts the AO board in a safe state by performing the following steps:

- Sets back the camera gain to 1
- Stops tracking for all AO tracking devices
- Closes the filter wheels and shutters
- Sets the TDCS in simulation mode, sends it ONLINE, and finally powers it off

ERIS_ao_tec_SafeWfs.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
SEQ.DUMMY	no	1..100 *(1)*	Dummy parameter - testing purpose
Fixed values:			
Parameter	Hidden	Value	Label

5.3.46 ERIS_ao_tec_TurnCameraOff

ERIS_ao_tec_TurnCameraOff.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
SEQ.DUMMY	no	1..100 *(1)*	Dummy parameter - testing purpose
Fixed values:			
Parameter	Hidden	Value	Label

5.3.47 ERIS_ao_tec_TurnCameraOn

ERIS_ao_tec_TurnCameraOn.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
SEQ.DUMMY	no	1..100 *(1)*	Dummy parameter - testing purpose
Fixed values:			
Parameter	Hidden	Value	Label

5.3.48 ERIS_cu_tec_FunctionalTest

This template moves all Calibration Unit devices and verifies their functionality.

ERIS_cu_tec_FunctionalTest.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
SEQ.INTERACTIVE	no	T F *(F)*	Interactive
Fixed values:			
Parameter	Hidden	Value	Label

5.3.49 ERIS_gen_tec_Mode

Puts the instrument in a specific operational mode (NIGHT, CALIB or DAY).

ERIS_gen_tec_Mode.tsf			
To be specified:			
Parameter	Hidden	Range *(Default)*	Label
SEQ.OPMODE	no	DAY NIGHT CALIB *(CALIB)*	Operational state of the instrument
Fixed values:			
Parameter	Hidden	Value	Label

6 Man pages

6.1 ERIS Acquisition Templates - IFS (SPIFFIER)

6.1.1 ERIS_ifs_acq_LGS.tsf(1)

NAME

```
ERIS_ifs_acq_LGS.tsfx - ERIS Acquisition Template signature file
```

DESCRIPTION

```
Acquisition template for SPIFFIER in AO LGS or SE mode.
This template includes an instrument setup that will be used for interactive
source centering. The setup can be different from the one used
by subsequent observing templates.

Main steps:
   * Any previous AO activity is stopped.
   * SPIFFIER devices start to move to the requested configuration
   * Telescope is preset on target in field tracking mode.
   * AO system and RTC are preset in LGS mode
   * If pupil tracking is requested, instrument rotator motion is stopped.
   * LGS star is acquired and LGS loop is closed
   * AO star is acquired and NGS loop is closed (skipped in SE mode)
   * Truth sensing loop is closed (skipped in SE mode)
   * AO loop gains are optimized for the current seeing conditions.
   * source is interactively centered on SPIFFIER
```

6.1.2 ERIS_ifs_acq_LGS_difftrack.tsf(1)

NAME

```
ERIS_ifs_acq_LGS_difftrack.tsfx - ERIS Acquisition Template signature file
```

DESCRIPTION

```
Acquisition template for SPIFFIER in AO LGS or SE mode with differential tracking.
Both the telescope target and the AO reference star can be non-sidereal objects.
This template includes an instrument setup that will be used for interactive
source centering. The setup can be different from the one used
by subsequent observing templates.

Main steps:
   * Any previous AO activity is stopped.
   * SPIFFIER devices start to move to the requested configuration
   * Telescope is preset on target in field tracking mode.
   * AO system and RTC are preset in LGS mode
   * If pupil tracking is requested, instrument rotator motion is stopped.
   * LGS star is acquired and LGS loop is closed
   * AO star is acquired and NGS loop is closed (skipped in SE mode)
   * Truth sensing loop is closed (skipped in SE mode)
   * AO loop gains are optimized for the current seeing conditions.
   * source is interactively centered on SPIFFIER
```

6.1.3 ERIS_ifs_acq_NGS.tsf(1)

NAME

```
ERIS_ifs_acq_NGS.tsfx - ERIS Acquisition Template signature file
```

DESCRIPTION

```
Acquisition template for SPIFFIER in AO NGS mode.
This template includes an instrument setup that will be used for interactive
source centering. The setup can be different from the one used
by subsequent observing templates.

Main steps:
   * Any previous AO activity is stopped.
   * SPIFFIER devices start to move to the requested configuration
   * Telescope is preset on target in field tracking mode.
   * AO system and RTC are preset in NGS mode
   * If pupil tracking is requested, instrument rotator motion is stopped.
   * AO star is acquired and NGS loop is closed
   * AO loop gains are optimized for the current seeing conditions.
   * source is interactively centered on SPIFFIER
```

6.1.4 ERIS_ifs_acq_NGS_difftrack.tsf(1)

NAME

```
ERIS_ifs_acq_NGS_difftrack.tsfx - ERIS Acquisition Template signature file
```

DESCRIPTION

```
Acquisition template for SPIFFIER in AO NGS mode with differential tracking.
Both the telescope target and the AO reference star can be non-sidereal objects.
This template includes an instrument setup that will be used for interactive
source centering. The setup can be different from the one used
by subsequent observing templates.

Main steps:
   * Any previous AO activity is stopped.
   * SPIFFIER devices start to move to the requested configuration
   * Telescope is preset on target in field tracking mode.
   * AO system and RTC are preset in NGS mode
   * If pupil tracking is requested, instrument rotator motion is stopped.
   * AO star is acquired and NGS loop is closed
   * AO loop gains are optimized for the current seeing conditions.
   * source is interactively centered on SPIFFIER
```

6.1.5 ERIS_ifs_acq_noAO.tsf(1)

NAME

```
ERIS_ifs_acq_noAO.tsfx - ERIS Acquisition Template signature file
```

DESCRIPTION

```
Acquisition template for SPIFFIER without AO.
This template includes an instrument setup that will be used for interactive
source centering. The setup can be different from the one used
by subsequent observing templates.

Main steps:
   * Any previous AO activity is stopped.
   * NIX devices start to move to the requested configuration
   * Telescope is preset on target in field tracking mode.
   * If pupil tracking is requested, instrument rotator motion is stopped.
   * source is interactively centered on SPIFFIER
```

6.2 ERIS Acquisition Templates - Imaging (NIX)

6.2.1 ERIS_nixAPP_acq_LGS.tsf(1)

NAME

```
ERIS_nixAPP_acq_LGS.tsfx - ERIS Acquisition Template signature file
```

DESCRIPTION

```
Acquisition template for NIX (APP mode) in AO LGS or SE mode.
This template includes an instrument setup that will be used for interactive
source centering. The setup can be different from the one used
by subsequent observing templates.
After source centering, the APP position is selected on the NIX pupil wheel.
```

```
Main steps:
   * Any previous AO activity is stopped.
   * NIX devices start to move to the requested configuration
   * Telescope is preset on target in field tracking mode.
   * AO system and RTC are preset in LGS mode
   * If pupil tracking is requested, instrument rotator motion is stopped.
   * LGS star is acquired and LGS loop is closed
   * AO star is acquired and NGS loop is closed (skipped in SE mode)
   * Truth sensing loop is closed (skipped in SE mode)
   * AO loop gains are optimized for the current seeing conditions.
   * source is interactively centered on NIX
   * APP is selected on the NIX pupil wheel.
```

6.2.2 ERIS_nixAPP_acq_NGS.tsf(1)

NAME

```
ERIS_nixAPP_acq_NGS.tsfx - ERIS Acquisition Template signature file
```

DESCRIPTION

```
Acquisition template for NIX (APP mode) in AO NGS mode.
This template includes an instrument setup that will be used for interactive
source centering. The setup can be different from the one used
by subsequent observing templates.
After source centering, the APP position is selected on the NIX pupil wheel.

Main steps:
   * Any previous AO activity is stopped.
   * NIX devices start to move to the requested configuration
   * Telescope is preset on target in field tracking mode.
   * AO system and RTC are preset in NGS mode
   * If pupil tracking is requested, instrument rotator motion is stopped.
   * AO star is acquired and NGS loop is closed.
   * AO loop gains are optimized for the current seeing conditions.
   * Source is interactively centered on NIX
   * APP is selected on the NIX pupil wheel.
```

6.2.3 ERIS_nixFPC_acq_NGS.tsf(1)

NAME

```
ERIS_nixFPC_acq_NGS.tsfx - ERIS Acquisition Template signature file
```

DESCRIPTION

```
Acquisition template for NIX (FPC mode) in AO NGS mode.
This template includes an instrument setup that will be used for interactive
source centering. The setup can be different from the one used
by subsequent observing templates.
After source centering, the coronograph position is inserted in the NIX optical path.

Main steps:
```

```
   * Any previous AO activity is stopped.
   * NIX devices start to move to the requested configuration
   * Telescope is preset on target in field tracking mode.
   * AO system and RTC are preset in NGS mode
   * If pupil tracking is requested (defaults to yes), instrument rotator motion is stopped.
   * AO star is acquired and NGS loop is closed.
   * AO loop gains are optimized for the current seeing conditions.
   * Source is interactively centered on NIX
   * Coronograph is selected NIX
```

6.2.4 ERIS_nixIMG_acq_LGS.tsf(1)

NAME

```
ERIS_nixIMG_acq_LGS.tsfx - ERIS Acquisition Template signature file
```

DESCRIPTION

```
Acquisition template for NIX (imaging mode) in AO LGS or SE mode.
This template includes an instrument setup that will be used for interactive
source centering. The setup can be different from the one used
by subsequent observing templates.

Main steps:
   * Any previous AO activity is stopped.
   * NIX devices start to move to the requested configuration
   * Telescope is preset on target in field tracking mode.
   * AO system and RTC are preset in LGS mode
   * If pupil tracking is requested, instrument rotator motion is stopped.
   * LGS star is acquired and LGS loop is closed
   * AO star is acquired and NGS loop is closed (skipped in SE mode)
   * Truth sensing loop is closed (skipped in SE mode)
   * AO loop gains are optimized for the current seeing conditions.
   * source is interactively centered on NIX
```

6.2.5 ERIS_nixIMG_acq_LGS_difftrack.tsf(1)

NAME

```
ERIS_nixIMG_acq_LGS_difftrack.tsfx - ERIS Acquisition Template signature file
```

DESCRIPTION

```
Acquisition template for NIX in AO LGS or SE mode with differential tracking.
Both the telescope target and the AO reference star can be non-sidereal objects.
This template includes an instrument setup that will be used for interactive
source centering. The setup can be different from the one used
by subsequent observing templates.

Main steps:
   * Any previous AO activity is stopped.
   * NIX devices start to move to the requested configuration
```

```
   * Telescope is preset on target in field tracking mode.
   * AO system and RTC are preset in LGS mode
   * If pupil tracking is requested, instrument rotator motion is stopped.
   * LGS star is acquired and LGS loop is closed
   * AO star is acquired and NGS loop is closed (skipped in SE mode)
   * Truth sensing loop is closed (skipped in SE mode)
   * AO loop gains are optimized for the current seeing conditions.
   * source is interactively centered on NIX
```

6.2.6 ERIS_nixIMG_acq_NGS.tsf(1)

NAME

```
ERIS_nixIMG_acq_NGS.tsfx - ERIS Acquisition Template signature file
```

DESCRIPTION

```
Acquisition template for NIX (imaging mode) in AO NGS mode.
This template includes an instrument setup that will be used for interactive
source centering. The setup can be different from the one used
by subsequent observing templates.

Main steps:
   * Any previous AO activity is stopped.
   * NIX devices start to move to the requested configuration
   * Telescope is preset on target in field tracking mode.
   * AO system and RTC are preset in NGS mode
   * If pupil tracking is requested, instrument rotator motion is stopped.
   * AO star is acquired and NGS loop is closed
   * AO loop gains are optimized for the current seeing conditions.
   * source is interactively centered on NIX
```

6.2.7 ERIS_nixIMG_acq_NGS_difftrack.tsf(1)

NAME

```
ERIS_nixIMG_acq_NGS_difftrack.tsfx - ERIS Acquisition Template signature file
```

DESCRIPTION

```
Acquisition template for NIX (imaging mode) in AO NGS mode with differential tracking.
Both the telescope target and the AO reference star can be non-sidereal objects.
This template includes an instrument setup that will be used for interactive
source centering. The setup can be different from the one used
by subsequent observing templates.

Main steps:
   * Any previous AO activity is stopped.
   * NIX devices start to move to the requested configuration
   * Telescope is preset on target in field tracking mode.
   * AO system and RTC are preset in NGS mode
   * If pupil tracking is requested, instrument rotator motion is stopped.
   * AO star is acquired and NGS loop is closed
```

```
   * AO loop gains are optimized for the current seeing conditions.
   * source is interactively centered on NIX
```

6.2.8 ERIS_nixIMG_acq_noAO.tsf(1)

NAME

```
ERIS_nixIMG_acq_noAO.tsfx - ERIS Acquisition Template signature file
```

DESCRIPTION

```
Acquisition template for NIX (imaging mode) without AO.
This template includes an instrument setup that will be used for interactive
source centering. The setup can be different from the one used
by subsequent observing templates.

Main steps:
   * Any previous AO activity is stopped.
   * NIX devices start to move to the requested configuration
   * Telescope is preset on target in field tracking mode.
   * If pupil tracking is requested, instrument rotator motion is stopped.
   * source is interactively centered on NIX
```

6.2.9 ERIS_nixLSS_acq_LGS.tsf(1)

NAME

```
ERIS_nixLSS_acq_LGS.tsfx - ERIS Acquisition Template signature file
```

DESCRIPTION

```
Acquisition template for NIX (LSS mode) in AO LGS or SE mode.
This template includes an instrument setup that will be used for interactive
source centering. The setup can be different from the one used
by subsequent observing templates.

Main steps:
   * Any previous AO activity is stopped.
   * NIX devices start to move to the requested configuration
   * Telescope is preset on target in field tracking mode.
   * AO system and RTC are preset in LGS mode
   * If pupil tracking is requested, instrument rotator motion is stopped.
   * LGS star is acquired and LGS loop is closed
   * AO star is acquired and NGS loop is closed (skipped in SE mode)
   * Truth sensing loop is closed (skipped in SE mode)
   * AO loop gains are optimized for the current seeing conditions.
   * Source is interactively centered on NIX
   * LSS is inserted in the NIX optical path
```

6.2.10 ERIS_nixLSS_acq_LGS_difftrack.tsf(1)

NAME

```
ERIS_nixLSS_acq_LGS_difftrack.tsfx - ERIS Acquisition Template signature file
```

DESCRIPTION

```
Acquisition template for NIX (LSS mode) in AO LGS or SE mode with differential tracking.
Both the telescope target and the AO reference star can be non-sidereal objects.
This template includes an instrument setup that will be used for interactive
source centering. The setup can be different from the one used
by subsequent observing templates.

Main steps:
   * Any previous AO activity is stopped.
   * NIX devices start to move to the requested configuration
   * Telescope is preset on target in field tracking mode.
   * AO system and RTC are preset in LGS mode
   * If pupil tracking is requested, instrument rotator motion is stopped.
   * LGS star is acquired and LGS loop is closed
   * AO star is acquired and NGS loop is closed (skipped in SE mode)
   * Truth sensing loop is closed (skipped in SE mode)
   * AO loop gains are optimized for the current seeing conditions.
   * Source is interactively centered on NIX
   * LSS is inserted in the NIX optical path
```

6.2.11 ERIS_nixLSS_acq_NGS.tsf(1)

NAME

```
ERIS_nixLSS_acq_NGS.tsfx - ERIS Acquisition Template signature file
```

DESCRIPTION

```
Acquisition template for NIX (LSS mode) in AO NGS mode.
This template includes an instrument setup that will be used for interactive
source centering. The setup can be different from the one used
by subsequent observing templates.

Main steps:
   * Any previous AO activity is stopped.
   * NIX devices start to move to the requested configuration
   * Telescope is preset on target in field tracking mode.
   * AO system and RTC are preset in NGS mode
   * If pupil tracking is requested, instrument rotator motion is stopped.
   * AO star is acquired and NGS loop is closed
   * AO loop gains are optimized for the current seeing conditions.
   * source is interactively centered on NIX
   * LSS is inserted in the NIX optical path
```

6.2.12 ERIS_nixLSS_acq_NGS_difftrack.tsf(1)

NAME

```
ERIS_nixLSS_acq_NGS_difftrack.tsfx - ERIS Acquisition Template signature file
```

DESCRIPTION

```
Acquisition template for NIX (LSS mode) in AO NGS mode with differential tracking.
Both the telescope target and the AO reference star can be non-sidereal objects.
This template includes an instrument setup that will be used for interactive
source centering. The setup can be different from the one used
by subsequent observing templates.

Main steps:
   * Any previous AO activity is stopped.
   * NIX devices start to move to the requested configuration
   * Telescope is preset on target in field tracking mode.
   * AO system and RTC are preset in NGS mode
   * If pupil tracking is requested, instrument rotator motion is stopped.
   * AO star is acquired and NGS loop is closed
   * AO loop gains are optimized for the current seeing conditions.
   * Source is interactively centered on NIX
   * LSS is inserted in the NIX optical path
```

6.2.13 ERIS_nixSAM_acq_NGS.tsf(1)

NAME

```
ERIS_nixSAM_acq_NGS.tsfx - ERIS Acquisition Template signature file
```

DESCRIPTION

```
Acquisition template for NIX (SAM mode) in AO NGS mode.
This template includes an instrument setup that will be used for interactive
source centering. The setup can be different from the one used
by subsequent observing templates.

Main steps:
   * Any previous AO activity is stopped.
   * NIX devices start to move to the requested configuration
   * Telescope is preset on target in field tracking mode.
   * AO system and RTC are preset in NGS mode
   * If pupil tracking is requested (defaults to yes), instrument rotator motion is stopped.
   * AO star is acquired and NGS loop is closed
   * AO loop gains are optimized for the current seeing conditions.
   * source is interactively centered on NIX
   * SAM is inserted in the NIX optical path
```

6.3 ERIS Observation Templates - IFS (SPIFFIER)

6.3.1 ERIS_ifs_obs_AutoJitter.tsf(1)

NAME

```
ERIS_ifs_obs_AutoJitter.tsfx - Exposures with random telescope offsets
```

SYNOPSIS

```
Science exposures with a random pattern of telescope offsets
```

DESCRIPTION

```
This template offsets the telescope between exposures according to a random
pattern of offsets automatically determined within the template The offsets
are distributed randomly within a box whose size is defined by the
parameter SEQ.JITTER.WIDTH (in arc seconds), with the condition that the
distance between any two points in a series of ten values (note
SEQ.POISSON) is greater than a certain minimum. This is intentionally done
to ensure that the 5 frames before and after any frame are spatially not
too close and can be safely used for creating sky frames without residual
objects for sky subtraction.

There is no telescope offset applied for the very first exposure.

Processing steps:
  - get a sequence of offsets using a Poisson distribution
    - set template reference setup:
        - set IBSM to "TELBEAM"
        - set SCSM to "SPIFFIER"
  - set SPIFFIER band and pre-optics scale
  - for SEQ,NOFF offset positions
    - fetch next offset from list
    - apply telescope offset (and set OCS.OFFSET.x FITS header words)
    - set OCS.CUMOFFS.RA and OCS.CUMOFFS.DEC FITS header words
    - take SEQ.NEXPO exposures with DET.DIT/DET.NDIT
  - if SEQ.RETURN is set to T
    - return to original position (zero offset)
```

6.3.2 ERIS_ifs_obs_FixedSkyOffset.tsf(1)

NAME

```
ERIS_ifs_obs_FixedSkyOffset.tsfx - Exposures with random telescope offsets
```

SYNOPSIS

```
Science exposures with a random pattern of telescope offsets around at
both the object position and a sku position
```

DESCRIPTION

```
The template moves the telescope alternatively between 'object' and 'sky'
positions (nodding). The 'object' positions are randomly distributed
(jittered) around the object (initial telescope position) and within a box
whose dimensions are set by the parameter \Jitter box width" (in
arcsec). The size of the jitter box should be typically between 4 and 32
times the selected SPAXEL size.
```

```
  The 'sky' positions are also randomly distributed around a fixed offset
  position (defined by the parameters \Alpha offset to sky" and \Delta offset
  to sky") from the original (target) telescope position. The box dimension
  of the random 'sky' positions are also set by the parameter \Jitter box
  width" around the initial 'sky' position, and therefore identical to those
  of the target jitter box.

  Two different object/sky sequence pattern are available. If SEQ.ABBA is 'T'
  the pattern will be ABBA,ABBA,ABBA... otherwise it will be ABA,ABA...
  In the first case (SEQ.ABBA == T) the parameter SEQ.NABCYCLES counts all
  AB and BA pairs, in the second case it counts all ABA triples.

  There is an option to change the \Number of exposures per offset position"
  such that the template takes NEXPO number of jittered exposures before
  nodding between the object and sky position.  This should be rarely needed
  for the long exposure times of the SINFONI IFS mode observations.

Processing steps:
  - get a sequence of offsets for the object position using a Poisson distribution
  - get a sequence of offsets for the sky position using a Poisson distribution
  - set template reference setup:
        - set IBSM to "TELBEAM"
        - set SCSM to "SPIFFIER"
  - set SPIFFIER band and pre-optics scale
  - for SEQ.NABCYCLES do
    - if SEQ.ABBA is 'T'
      - if current loop iteration count is even
        - set DPR.TYPE FITS keyword to 'OBJECT'
        - fetch next offset from obejct offset list
        - apply telescope offset (and set OCS.OFFSET.x FITS header words)
        - set OCS.CUMOFFS.RA and OCS.CUMOFFS.DEC FITS header words
        - take SEQ.NEXPO exposures with DET.DIT/DET.NDIT
        - set DPR.TYPE FITS keyword to 'SKY'
        - fetch next offset from obejct sky list
        - apply telescope offset (and set OCS.OFFSET.x FITS header words)
        - set OCS.CUMOFFS.RA and OCS.CUMOFFS.DEC FITS header words
        - take SEQ.NEXPO exposures with DET.DIT/DET.NDIT
      - else (current loop iteration count is odd)
        - set DPR.TYPE FITS keyword to 'SKY'
        - fetch next offset from obejct sky list
        - apply telescope offset (and set OCS.OFFSET.x FITS header words)
        - set OCS.CUMOFFS.RA and OCS.CUMOFFS.DEC FITS header words
        - take SEQ.NEXPO exposures with DET.DIT/DET.NDIT
        - set DPR.TYPE FITS keyword to 'OBJECT'
        - fetch next offset from obejct offset list
        - apply telescope offset (and set OCS.OFFSET.x FITS header words)
        - set OCS.CUMOFFS.RA and OCS.CUMOFFS.DEC FITS header words
        - take SEQ.NEXPO exposures with DET.DIT/DET.NDIT
    - else (SEQ.ABBA is not 'T')
      - set DPR.TYPE FITS keyword to 'OBJECT'
      - fetch next offset from obejct offset list
      - apply telescope offset (and set OCS.OFFSET.x FITS header words)
      - set OCS.CUMOFFS.RA and OCS.CUMOFFS.DEC FITS header words
      - take SEQ.NEXPO exposures with DET.DIT/DET.NDIT
      - set DPR.TYPE FITS keyword to 'SKY'
      - fetch next offset from obejct sky list
      - apply telescope offset (and set OCS.OFFSET.x FITS header words)
      - set OCS.CUMOFFS.RA and OCS.CUMOFFS.DEC FITS header words
```

```
    - take SEQ.NEXPO exposures with DET.DIT/DET.NDIT
    - set DPR.TYPE FITS keyword to 'OBJECT'
    - fetch next offset from obejct offset list
    - apply telescope offset (and set OCS.OFFSET.x FITS header words)
    - set OCS.CUMOFFS.RA and OCS.CUMOFFS.DEC FITS header words
    - take SEQ.NEXPO exposures with DET.DIT/DET.NDIT
- if SEQ.RETURN is set to T
  - return to original position (zero offset)
```

6.3.3 ERIS_ifs_obs_GenericOffset.tsf(1)

NAME

ERIS_ifs_obs_GenericOffset.tsfx - Science exposure with explicit telescope offsets

SYNOPSIS

Template to take science exposures with explicit lists of object and sky telescope offsets

DESCRIPTION

The GenericOffset template has the flexibility to do any sequence of telescope offsets, either in detector or sky coordinates. The sequence of \Object" and \Sky" observations is defined by the user. The number of integration (NDIT) per detector readout can be selected differently for object and sky positions.

The parameter \Offset coordinate type selection" defines if the user selected offsets are executed with respect to the detector XY coordinates or the sky RA,DEC coordinates. The offsets are defined as list of parameters \List of offsets in RA or X" and \List of offsets in DEC or Y", respectively. The offsets are cumulative - relative to the previous position. If the parameter \Offset coordinate type selection" = \SKY", then the offsets have to be considered and specified as telescope offsets, following the offset conventions and definitions given in section 5.7. If the parameter \Offset coordinate type selection" = \DETECTOR", the offset sequence as given in \List of offsets in RA or X" and \List of offsets in DEC or Y" specifies what the target is doing on the detector.

Additionally the observation type and the number of integrations (NDIT) can be defined for any of the object or sky positions in the parameters \List of observation types (O or S)" and \List of number of integrations (NDIT)", respectively. In case of type 'O' the archived data files are flagged as \SCIENCE" and the AO loop is closed for AO observations (NGS, LGS and SE mode). In case of type 'S' the archived files are marked as \SKY" and the loop is opened to allow offsets beyond the range of the field selector mirror which images the science field to the spectrograph image slicer while the NGS (TTS) is centered on the WFS.

The total number of exposures is defined by the parameter \Number of offset positions". This number maybe different from the number of elements in the aforementioned lists. Lists do not have to have the same length. If the number of offset exposures is larger than the length of the list, then the list is restarted from the beginning until the correct number of frames

```
have been acquired.  The total integration time is DIT times the sum of the
NDIT taken at the specified \Number of offset positions". The lists may
also be longer than the \Number of offset positions", but these surplus
offsets will be ignored by the system. It is good practice to use lists of
equal length, or lists which contain only one parameter if one of the
parameters shall remain unchanged (like NDIT).

Warning: Make sure that you do not have offset positions for type 'O'
exposures outside of the range of the field selector.

Processing steps:
- set template reference setup:
    - set IBSM to "TELBEAM"
    - set SCSM to "SPIFFIER"
- set SPIFFIER band and pre-optics scale
- for SEQ.NABCYCLES do
  - read next from SEQ.OBSTYPE list
  - read next offsets from SEQ.OFFSET1 and SEQ.OFFSET2 lists
  - read next NDIT from DET.NDIT list
  - set DPR.TYPE keyword
  - apply telescope offset (and set OCS.OFFSET.x FITS header words)
  - set OCS.CUMOFFS.RA/DEC and OCS.CUMOFFS.X/Y FITS header words
  - take SEQ.NEXPO exposures with DET.DIT/NDIT
- if SEQ.RETURN is set to T
  - return to original position (zero offset)
```

6.4 ERIS Observation Templates - Imaging (NIX)

6.4.1 ERIS_nixAPP_obs_GenericOffset.tsf(1)

NAME

```
ERIS_nixAPP_obs_GenericOffset.tsfx---observing with sequence of
                                    telescope offsets in APP mode
```

SYNOPSIS

```
Template for performing observing with sequence of telescope offsets
in APP mode
```

DESCRIPTION

```
This is similar to ERIS_nixIMG_obs GenericOffset. With the handling of
the offsets in pupil tracking mode accounts for most of the differences
to ERIS_nixIMG_obs GenericOffset. APP observing template allows cube mode,
moves object around on the detector, but not nodding fully to sky.

do sequence of telescope offsets, either in detector or sky coordinates.
Telescope offsets are defined as lists with the parameters of offsets
in RA or X and List of offsets in DEC or Y. The offsets are relative
to the previous position and are in RA and DEC or in X and Y depending
on the Offset Coordinates parameter. Additionally, the observation type
can be defined for each image, and is entered as a list in the parameter
\Observation Type (O or S)." O stands for Object and assigns the
```

```
DPR.TYPE header keyword to OBJECT. S stands for Sky and assigns the
DPR.TYPE header keyword to SKY. For Object (obType==OBJ), the AO loop
is always closed. But, for SKY (obType==SKY), we would like to give user
an option to either keep AO closed (the offset must then be less than a
predefined limit) or set AO in pause mode, by defining ON or OFF in
another parameter list (obAOFlag)

see sequence flow in ERIS_nixIMG_obs_AutoJitter.
```

6.4.2 ERIS_nixFPC_obs_GenericOffset.tsf(1)

NAME

```
ERIS_nixFPC_obs_GenericOffset.tsfx -- observing with sequence of
                                      telescope offsets in FPC mode
```

SYNOPSIS

```
Template for performing observing with sequence of telescope offsets
in FPC mode
```

DESCRIPTION

```
Similar to ERIS_nixIMG_obs_GenericOffset, but with the precise alignment at the beginning.

do sequence of telescope offsets, either in detector or sky coordinates.
Telescope offsets are defined as lists with the parameters of offsets
in RA or X and List of offsets in DEC or Y. The offsets are relative
to the previous position and are in RA and DEC or in X and Y depending
on the Offset Coordinates parameter. Additionally, the observation type
can be defined for each image, and is entered as a list in the parameter
"Observation Type (O or S)". O stands for Object and assigns the
DPR.TYPE header keyword to OBJECT. S stands for Sky and assigns the
DPR.TYPE header keyword to SKY. For Object (obType==OBJ), the AO loop
is always closed. But, for SKY (obType==SKY), we would like to give user
an option to either keep AO closed (the offset must then be less than a
predefined limit) or set AO in pause mode, by defining ON or OFF in
another parameter list (obAOFlag)
 1) set all wheels internal positions based on[camera-NXCW, pupil-NXPW,
    filter-NXFW]
 2) set AO focus offset and extra FITS Key words needed
 3) read all wheels positions from OLDB; check against internal ones
    (exclude ImageSelector-NXIS), return check result ==> chkRslt
 4) check if NXIS is in DARK position ==> nxisClosed
 5) parepare readout window parameters
 6) prepare offSet list{OFFSET1/2,OBSTYPE,OBAOFLAG,DIT,NDIT} => offLen
 7) prepare all parameters (full window) for persistence data recording
 8) if {nxisClosed == "F" }
    {
       move NXIS to DARK and AOFoffset while recording persistence data
    } else  {  move AOFoffset
    }
 9) we are in DARK, so, move mechanism (not NXIS) to user requested positions
 10)if {QACITS flag==T } {
      set DET initial parameters for QACITS, set singleLongExp for persistence recording
```

```
    }
11) start telescope offset and exposurea
    loop offLen
    {
       Start Persistence recording (full window)
       if { $obType =="O" }  { Offset Telescope with parameters
       } else {                Offset Telescope with parameters + $obAOFlag
       }

       If { first offset ==Yes} { move NXIS from DARK to user asked position}
       End Persistence recoding

       if {QACITS flag==F} {
           setup DET with window readout parameters
           start "No Of exposures"
       } else {
           setup DET parameters for QACITS for Obj/Sky target
           start "No Of exposures"
       }
    }
12) anything goes wrong,
    {
       End Persistence recording
       if { $SEQ(QACITS.ST) == "T" } {
          restore some of DET paremeters set for QACTIS
       }
    }
13) Start Persistence recording (full window)
14) move NXIS=DARK; if ReturnTelescope ==T, Telescope Return
15) End Persistence recording
16) exit
```

6.4.3 ERIS_nixIMG_obs_AutoJitter.tsf(1)

NAME

```
ERIS_nixIMG_obs_AutoJitter.tsfx---observing with a pseudo-random sequence
                                  of Jitter in IMG mode
```

SYNOPSIS

```
Template for performing a pseudo-random sequence of offsets (Jitter)
between exposures  in IMG mode
```

DESCRIPTION

This template offsets the telescope between exposures according to a pseudo-random sequence of offsets (Jitter) automatically determined by the template. It is ideal for long integrations on sparse fields, and does not require a long list of offsets to be defined. Options include saving data as a cube

1) set all wheels internal positions based on[camera-NXCW, pupil-NXPW, filter-NXFW]
2) set AO focus offset and extra FITS Key words needed
3) read all wheels positions from OLDB; check against internal ones

```
   (exclude ImageSelector-NXIS), return check result ==> chkRslt
4) check if NXIS is in DDARK position ==> nxisClosed
5) parepare readout window parameters
6) prepare all parameters (full window) for persistence data recording
7) if {doPersistFlag == "T" } {
      if { $nxisClosed== "F" &&  $nixShutterCloseFlag  == "T" } {
         record persistence data  (full window)
         move NXIS to DARK and other mechanism (not NXIS) to user requested
         positions and AOFoffset
      } else {
         move other mechanism (NXIS alreay DARK) to user requested and AOFoffset
      }
    }
8) start telescope jitter offset and exposure
   if {=="ERIS_nixLSS_obs_AutoJitterOnSlit"} {
          call SlitTilt Correction for the jitter pattern
   }
   loop No_of_Offset
   {
      computer i-th absolute jitter offsets in RA, DEC
      convert to relative offset
      if { first offset ==Yes } {
          if {doPersistFlag == "F"} {
             move NXIS and other mechanism to user requested positions and Teloffset
          } else {
            record Persistence data (full window)
            move NXIS to user asked Position and Teloffset
          }
        } else {
            if {doPersistFlag == "T"} { record Persistence data }
            Teloffset
        }
      setup DET parameters for exposure
      start normal "No of exposures"
     }
   }

9) anything goes wrong, End Persistence recording if doPersistFlag == "T"

10) if { $nixShutterCloseFlag == "T" } {
       record Persistence data if doPersistFlag == "T"
       move NXIS=DARK; if ReturnTelescope ==T, Telescope Return
    } else {
       record Persistence data if doPersistFlag == "T"
       if ReturnTelescope ==T, Telescope Return
    }
11) exit
```

6.4.4 ERIS_nixIMG_obs_GenericOffset.tsf(1)

NAME

```
ERIS_nixIMG_obs_GenericOffset.tsfx---observing with sequence of
                                    telescope offsets in IMG mode
```

SYNOPSIS

```
Template for performing observing with sequence of telescope offsets
in IMG mode
```

DESCRIPTION

```
do sequence of telescope offsets, either in detector or sky coordinates.
Telescope offsets are defined as lists with the parameters of offsets
in RA or X and List of offsets in DEC or Y. The offsets are relative
to the previous position and are in RA and DEC or in X and Y depending
on the Offset Coordinates parameter. Additionally, the observation type
can be defined for each image, and is entered as a list in the parameter
\Observation Type (O or S)." O stands for Object and assigns the
DPR.TYPE header keyword to OBJECT. S stands for Sky and assigns the
DPR.TYPE header keyword to SKY. For Object (obType==OBJ), the AO loop
is always closed. But, for SKY (obType==SKY), we would like to give user
an option to either keep AO closed (the offset must then be less than a
predefined limit) or set AO in pause mode, by defining ON or OFF in
another parameter list (obAOFlag)
 1) set all wheels internal positions based on[camera-NXCW, pupil-NXPW,
    filter-NXFW]
 2) set AO focus offset and extra FITS Key words needed
 3) read all wheels positions from OLDB; check against internal ones
    (exclude ImageSelector-NXIS), return check result ==> chkRslt
 4) check if NXIS is in DARK position ==> nxisClosed
 5) parepare readout window parameters
 6) prepare offSet list{OFFSET1/2,OBSTYPE,OBAOFLAG,DIT,NDIT} => offLen
 7) prepare all parameters (full window) for persistence data recording
 8) if {doPersistFlag == "T" } {
       if { $nxisClosed== "F" &&  $nixShutterCloseFlag  == "T" } {
          record persistence data  (full window)
          move NXIS to DARK and other mechanism (not NXIS) to user requested
          positions and AOFoffset
       } else {
          move other mechanism (NXIS alreay DARK) to user requested and AOFoffset
       }
     }
9) start telescope offset and exposure
    loop offLen
    {
       if {=="ERIS_nixLSS_obs_GenericOffset" || == "ERIS_nixLSS_cal_StandardStar"} {
           call SlitTilt Correction
       }
       if { $obType =="O" }  { Offset Telescope with parameters
       } else {                Offset Telescope with parameters + $obAOFlag
       }
       if { first offset ==Yes } {
           if {doPersistFlag == "F"} {
              move NXIS and other mechanism to user requested positions and Teloffset
           } else {
             record Persistence data (full window)
             move NXIS to user asked Position and Teloffset
           }
         } else {
             if {doPersistFlag == "T"} { record Persistence data }
             Teloffset
         }
       setup DET parameters for exposure
       start normal "No of exposures"
```

```
    }
10) anything goes wrong, End Persistence recording if doPersistFlag == "T"
11) if { $nixShutterCloseFlag == "T" } {
       record Persistence data if doPersistFlag == "T"
       move NXIS=DARK; if ReturnTelescope ==T, Telescope Return
    } else {
       record Persistence data if doPersistFlag == "T"
       if ReturnTelescope ==T, Telescope Return
    }
12) exit
```

6.4.5 ERIS_nixLSS_obs_AutoJitterOnSlit.tsf(1)

NAME

```
ERIS_nixLSS_obs_AutoJitterOnSlit.tsfx---observing with a pseudo-random sequence
                                    of Jitter ofsset up and down the slit in LSS mode
```

SYNOPSIS

```
Template for performing a pseudo-random sequence of offsets (Jitter)
between exposures up and down the slit in LSS mode
```

DESCRIPTION

```
Similar to ERIS_nixIMG_obs_AutoJitter.
This template measures the spectrum of objects in the slit in such a way that the
sky background spectrum can be derived as well. This is done by jittering the target
object up and down the slit in the same way as is done for imaging. The observer would
specify a jitter box, and there may also need to be a minimum distance between successive
jitters.

call SlitTilt Correction for the jitter pattern to only along the slit

see sequence flow in ERIS_nixIMG_obs_AutoJitter.
```

6.4.6 ERIS_nixLSS_obs_GenericOffset.tsf(1)

NAME

```
ERIS_nixLSS_obs_GenericOffset.tsfx---observing with sequence of
                                       telescope offsets in LSS mode
```

SYNOPSIS

```
Template for performing observing with sequence of telescope offsets
in LSS mode
```

DESCRIPTION

```
This is similar to ERIS_nixIMG_obs_GenericOffset. Take a sequence of
spectra with the object placed at a range of specified offsets along the slit.

restrict to
SEQ.OFFSET.COORDS  "SKY";
SEQ.OFFSET1.LIST  "List of offsets coordinates parallel to the slit"
SEQ.OFFSET2.LIST  "List of offsets coordinates perpendicular to the slit"

call SlitTilt Correction for re-align offset

see sequence flow in ERIS_nixIMG_obs_GenericOffset.
```

6.4.7 ERIS_nixSAM_obs_GenericOffset.tsf(1)

NAME

```
ERIS_nixSAM_obs_GenericOffset.tsfx---observing with sequence of
                                    telescope offsets in SAM mode
```

SYNOPSIS

```
Template for performing observing with sequence of telescope offsets
in SAM mode
```

CAUTIONS

```
This is similar to ERIS_nixIMG_obs GenericOffset. However not compulsory,
SAM will use cube mode as a default. This and the handling of the offsets
in pupil tracking mode, account for most of the differences with
ERIS_nixIMG_obs GenericOffset

do sequence of telescope offsets, either in detector or sky coordinates.
Telescope offsets are defined as lists with the parameters of offsets
in RA or X and List of offsets in DEC or Y. The offsets are relative
to the previous position and are in RA and DEC or in X and Y depending
on the Offset Coordinates parameter. Additionally, the observation type
can be defined for each image, and is entered as a list in the parameter
\Observation Type (O or S)." O stands for Object and assigns the
DPR.TYPE header keyword to OBJECT. S stands for Sky and assigns the
DPR.TYPE header keyword to SKY. For Object (obType==OBJ), the AO loop
is always closed. But, for SKY (obType==SKY), we would like to give user
an option to either keep AO closed (the offset must then be less than a
predefined limit) or set AO in pause mode, by defining ON or OFF in
another parameter list (obAOFlag)

see sequence flow in ERIS_nixIMG_obs_AutoJitter.
```

6.5 ERIS Calibration Templates - IFS (SPIFFIER)

6.5.1 ERIS_ifs_cal_Arcs.tsf(1)

NAME

```
ERIS_ifs_cal_Arcs.tsfx - ERIS/SPIFFIER wavelength calibration
```

SYNOPSIS

```
Wavelength calibration template for a single ERIS/SPIFFIER band/scale
setting.
```

DESCRIPTION

```
Acquire emission-line lamp spectra to determine the wavelength scale
for each spatial pixel.

The required pen ray lamps (Ne, Ar, Kr or Xe) and DIT are automatically
selected by the template according to the BAND and SPXW setting.

Take NEXPO exposures for every pen ray lamps setting and NEXPO exposures
for every unique (DIT) dark settting.

Processing steps:
  - get required arc lamp exposures settings wtih corresponding DITs
  - copy arc lamp exposure DITs to dark exposure DIT list
  - remove identical DITs from dark exposure DIT list
  - set template reference setup:
      - set IBSM to "CALUNIT"
      - set SCSM to "SPIFFIER"
      - set ISSM to "IN"
      - switch off all calibration lamps
  - set grating, filter and pre-optics to requested settings
  - take all dark exposures from dark exposure DIT list
  - for all required arc lamps:
      - switch  on arc lamp
      - take arc lamp exposure
      - turn off arc lamp
  - set filter wheel to a "closed" position
```

6.5.2 ERIS_ifs_cal_Darks.tsf(1)

NAME

```
ERIS_ifs_cal_Darks.tsfx - ERIS/SPIFFIER dark exposure calibration
```

SYNOPSIS

```
Template to take ERIS/SPIFFIER dark exposures
```

DESCRIPTION

```
Create master dark frames for each exposure time (DIT * NDIT sequence) used
for the science observations.  Take NEXPO exposures with the instrument
shutter closed, for each exposure time used for the science observations.

Processing steps:
  - set template reference setup:
```

```
        - set IBSM to "CALUNIT"
        - set SCSM to "SPIFFIER"
        - set filter wheel to "Closed1"
        - switch off all calibration lamps
    - take NEXP0 dark exposures with NDIT/DIT
```

6.5.3 ERIS_ifs_cal_GenericOffset.tsf(1)

NAME

```
ERIS_ifs_cal_GenericOffset.tsfx - Science exposures with generic offsets.
```

SYNOPSIS

```
ERIS/SPIFFIER science exposure template with generic offsets for calibration.
```

DESCRIPTION

```
This template is exactly the same as ERIS_ifs_obs_GenericOffset except it
is accounted as CALIB.

See description of ERIS_ifs_obs_GenericOffset template.

This calibration template will change the following FITS header keywords:
  - DPR.CATG to "CALIB"
  - DPR.TYPE to "CALIBRATOR"
```

6.5.4 ERIS_ifs_cal_LampFlats.tsf(1)

NAME

```
ERIS_ifs_cal_LampFlats.tsfx - ERIS/SPIFFIER lamp flats calibration
```

SYNOPSIS

```
Template for flat lamp exposures for a list of band/scale settings
```

DESCRIPTION

```
Provide high SNR flat field exposures for the correction of pixel-to-pixel
sensitivity of each detector pixel for each requested BAND/SCALE
combination.

When the DET.DIT and/or the QTH.INTENS is set to 0.0 an optimized value
for the requested setting will be chosen driven by the
BAND/SCALE combination.  The list of BAND/SCALE combinations is sorted
according the flat lamp intensity to minimize the flat lamp stabilization
times.

For every requested BAND/SCALE combination take NEXP0 exposures with the
calibration unit set towards the flat lamp and NEXP0 exposures with the
lamp off.
```

```
Processing steps:
  - get list of optimized DIT and QTH.INTENS settings for requested
        band/scale combinations
  - get a dictionary for the optimized DIT settings
  - get a dictionary for the optimized QTH.INTENS settings
  - get a list of [QTH.INTENS band/scale] pairs which is sorted with
        increasing QTH.INTENS values
  - set template reference setup:
     - set IBSM to "CALUNIT"
     - set SCSM to "SPIFFIER"
     - set ISSM to "IN"
     - switch off all calibration lamps
  - take NEXPO dark exposures for all requested band/scale settings
  - loop through [QTH.INTENS band/scale] list
     - is the next band/scale setting member of the requested settings
     - if yes:
       - is the current QTH.INTENS different than the previous one
         - if yes:
           - set the new QTH.INTENS value
           - wait 120 seconds for stabilization
       - take NEXPO flat exposures for the current band/scale setting
  - set filter wheel to a "closed" position
```

6.5.5 ERIS_ifs_cal_PSF.tsf(1)

NAME

```
ERIS_ifs_cal_PSF.tsfx - Calibration template for PSF measurements
```

SYNOPSIS

```
Template to take science exposures for PSF determination
```

DESCRIPTION

```
Determine instrument/AO point spread function. Take observations of a PSF
standard, typically NEXPO exposures on source and NEXPO exposures
off-source for background subtraction, depending on the star's brightness.

This template uses the same script as ERIS_ifs_obs_GenericOffset one.  See
description of ERIS_ifs_obs_GenericOffset template.

This calibration template will change the following FITS header keywords:
  - DPR.CATG to "CALIB"
  - DPR.TYPE to "PSF-CALIBRATOR"#
```

6.5.6 ERIS_ifs_cal_StandardStar.tsf(1)

NAME

```
ERIS_ifs_cal_StandardStar.tsfx- Template for standard star calibration
```

SYNOPSIS

```
Template for standard star calibration
```

DESCRIPTION

```
Correct for the atmospheric (and instrument) transmission transmission in
the observed science data. Photometric calibration is achieved by using
telluric standards of known magnitudes. Take observations of a standard
star, typically NEXPO exposures on source and NEXPO exposures off-source
for background sub- traction, depending on the star's brightness.

This template uses the same script as ERIS_ifs_obs_GenericOffset one.  See
description of ERIS_ifs_obs_GenericOffset template.

This calibration template will change the following FITS header keywords:
  - DPR.CATG to "CALIB"
  - DPR.TYPE to "STD"
```

6.5.7 ERIS_ifs_cal_SpecPhot.tsf(1)

NAME

```
ERIS_ifs_cal_SpecPhot.tsfx- Template for spectrophotometric standards calibration
```

SYNOPSIS

```
Template for spectrophotometric standards calibration
```

DESCRIPTION

```
Same sequence of ERIS_ifs_obs_GenericOffset, used to observe
spectrophotometric standards
```

6.6 ERIS Calibration Templates - Imaging (NIX)

6.6.1 ERIS_nix_cal_Darks.tsf(1)

NAME

```
ERIS_nix_cal_Darks.tsfx---dark measurement in IMG mode
```

SYNOPSIS

```
Template for performing dark measurement in IMG mode
```

DESCRIPTION

[1]Last change: 2023-07-25 17:57

```
This is standard ESO routine to observe darks. Obtain a 'master'
dark frame that can be subtracted from other frames to remove bias
and pattern noise.

1) prepare DIT/NDIT/READOUT List
2) move Imager selector-NXIS and others to DARK position
3) loop through NoOfExpo
   {
      loop through each item from DIT/NDIT/READOUT list
      {
        setup DET parameters [DIT(i)/NDIT(i)/READOUT(i)] for exposure
        start one exposures
      }
   }
4) exit
```

6.6.2 ERIS_nixIMG_cal_Astrom.tsf(1)

NAME

```
ERIS_nixIMG_cal_Astrom.tsfx --- NIX astrometric standards
```

SYNOPSIS

```
  Template for observing NIX astrometric standards
```

DESCRIPTION

```
Same sequence of NIX_obs_GenericOffsets, used to observe
astrometric standards
```

6.6.3 ERIS_nixIMG_cal_LampFlats.tsf(1)

NAME

```
ERIS_nixIMG_cal_LampFlats.tsfx---flat calibartion using CU Lamp in IMG mode
```

SYNOPSIS

```
Template for performing flat field calibration with CU Lamp in JHK band
```

DESCRIPTION

```
This is standard ESO routine to observe flats. Use a CU lamp to bath the
detector in even illumination. The data is used to correct for pixel to
pixel differences in sensitivity. This is only for bands J H K; since at
L and M the lamp does not produce enough flux. A series of lamp on/off
pairs obtained with the same detector parameters (DIT,NDIT, readout-mode)
and instrument configuration (filter, pixelscale).
```

[1]Last change: 2023-07-25 17:57

```
 1) setup ERIS using CU/Qth Lamp for NIX, set all NIX wheels internal
    positions based on[camera-NXCW, pupil-NXPW, filter-NXFW]
 2) set AO focus offset and extra FITS Key words needed
 3) read all wheels positions from OLDB; check against internal ones
    (exclude ImageSelector-NXIS), return check result ==> chkRslt
 4) check if NXIS is in DDARK position ==> nxisClosed
 5) prepare all parameters (full window) for persistence data recording
 6) if {nxisClosed == "F" }
    {
      move NXIS to DARK and AOFoffset while recording persistence data
    } else {  move AOFoffset
    }
 7) we are in DARK, switch on CU Lamp
 8) take expposures with NXIS => user asked Position and DARK
    {
       #==> ON exposure
       Start Persistence recording (full window)
       move NXIS from DARK to user asked Position
       End Persistence recoding

       setup DET parameters for exposure
       start "No of exposures"

       #==> OFF exposure
       Start Persistence recording (full window)
       move NXIS to DARK Position
       End Persistence recoding

       setup DET parameters for exposure
       start "No of exposures"
    }
 9) anything goes wrong, End Persistence recording
10) Start Persistence recording (full window)
11) move NXIS=DARK;
12) End Persistence recording
13) exit
```

6.6.4 ERIS_nixIMG_cal_SkyFlats.tsf(1)

NAME

ERIS_nixIMG_cal_SkyFlats.tsfx---flat calibartion using sky in IMG mode

SYNOPSIS

Template for performing flat field calibration in L & M band taking a series of measurements of the sky.

DESCRIPTION

CU does not provide enough flux for a lamp flat field to be taken for L and M. Hence, for L and M, the flat field is obtained by taking a series of measurements of the sky, using full window
this is similar to ERIS_nixIMG_obs_AutoJitter.

This template offsets the telescope between exposures according to a pseudo-random sequence of offsets (Jitter) automatically determined by the template. It is ideal for long integrations on sparse fields, and does not require a long list of offsets to be defined. Options include saving data as a cube.

see sequence flow in ERIS_nixIMG_obs_AutoJitter.

6.6.5 ERIS_nixIMG_cal_StandardStar.tsf(1)

NAME

ERIS_nixIMG_cal_StandardStar.tsfx---observing with sequence of telescope offsets for a standard star in IMG mode

SYNOPSIS

Template for performing observing with sequence of telescope offsets for a standard star in IMG mode

DESCRIPTION

This is similar to ERIS_nixIMG_obs_GenericOffset but for a standard star, necessary to ensure correct header keywords

do sequence of telescope offsets, either in detector or sky coordinates. Telescope offsets are defined as lists with the parameters of offsets in RA or X and List of offsets in DEC or Y. The offsets are relative to the previous position and are in RA and DEC or in X and Y depending on the Offset Coordinates parameter. Additionally, the observation type can be defined for each image, and is entered as a list in the parameter \Observation Type (O or S)." O stands for Object and assigns the DPR.TYPE header keyword to OBJECT. S stands for Sky and assigns the DPR.TYPE header keyword to SKY. For Object (obType==OBJ), the AO loop is always closed. But, for SKY (obType==SKY), we would like to give user an option to either keep AO closed (the offset must then be less than a predefined limit) or set AO in pause mode, by defining ON or OFF in another parameter list (obAOFlag)

see sequence flow in ERIS_nixIMG_obs_GenericOffset

6.6.6 ERIS_nixIMG_cal_TwFlats.tsf(1)

NAME

ERIS_nixIMG_cal_TwFlats.tsfx---flat calibartion using twilight in IMG mode

SYNOPSIS

Template for performing flat field calibration in JHK band taking a series of measurements of twlight in IMG mode.

DESCRIPTION

```
This is standard ESO routine to observe flats
Instead of using CU lamp, twilight is used
for JHK band. The twilight flat field can be used in combination
with an existing lamp flat field to calibrate the difference in
detector illumination between the sky and CU lamp
  1) prepare lists of (NXCW/NXPW/NXFW; DIT/NDIT/READOUT )
  2) set all wheels internal positions based on[camera-NXCW(0),
     pupil-NXPW(0),filter-NXFW(0)]
  3) set AO focus offset and extra FITS Key words needed
  4) read all wheels positions from OLDB; check against internal ones
     (exclude ImageSelector-NXIS), return check result ==> chkRslt
  5) check if NXIS is in DARK position ==> nxisClosed
  6) prepare all parameters (full window) for persistence data recording
  7) if {nxisClosed == "F" }
     {
       move NXIS to DARK and AOFoffset while recording persistence data
     } else {  move AOFoffset
     }
  8) we are in DARK, start sky flat measurement
     loop through each item from list
     {
        Start Persistence recording (full window)
            based on NXCW(i)/NXPW(i)/NXFW(i), move NIX wheels to asked position
        if not already in
        set AO focus offset and extra FITS Key words needed
        End Persistence recoding

        setup DET parameters for exposure
        start "No of exposures"
     }
  9) anything goes wrong, End Persistence recording
 10) Start Persistence recording (full window)
 11) move NXIS=DARK; if ReturnTelescope ==T, Telescope Return
 12) End Persistence recording
 13) exit
```

6.6.7 ERIS_nixLSS_cal_StandardStar.tsf(1)

NAME

```
ERIS_nixLSS_cal_StandardStar.tsfx---observing with sequence of telescope
                                   offsets for a standard star in LSS mode
```

SYNOPSIS

```
  Template for performing observing with sequence of telescope offsets
  for a standard star in LSS mode
```

DESCRIPTION

```
This is similar to ERIS_nixLSS_obs_GenericOffset but with Slit in beam
for a standard star, necessary to ensure correct header keywords

restrict to
```

```
SEQ.OFFSET.COORDS  "SKY";
SEQ.OFFSET1.LIST  "List of offsets coordinates parallel to the slit"
SEQ.OFFSET2.LIST  "List of offsets coordinates perpendicular to the slit"

call SlitTilt Correction for re-align offset

see sequence flow in ERIS_nixIMG_obs_GenericOffset.
```

6.7 ERIS Technical Templates - IFS (SPIFFIER)

6.7.1 ERIS_ifs_tec_BabySteps.tsf(1)

NAME

```
ERIS_ifs_tec_BabySteps.tsfx - IFS Technical Template
```

6.7.2 ERIS_ifs_tec_CheckInternalFocus.tsf(1)

NAME

```
ERIS_ifs_tec_CheckInternalFocus.tsfx - IFS Technical Template
```

6.7.3 ERIS_ifs_tec_CheckPupil.tsf(1)

NAME

```
ERIS_ifs_tec_CheckPupil.tsfx - IFS Technical Template
```

6.7.4 ERIS_ifs_tec_EastWest.tsf(1)

NAME

```
ERIS_ifs_tec_EastWest.tsfx - IFS Technical Template
```

6.7.5 ERIS_ifs_tec_FibreFocus.tsf(1)

NAME

```
ERIS_ifs_tec_FibreFocus.tsfx - IFS Technical Template
```

6.7.6 ERIS_ifs_tec_FreeSetup.tsf(1)

NAME

```
ERIS_ifs_tec_FreeSetup.tsfx - IFS Technical Template
```

6.7.7 ERIS_ifs_tec_FunctionalTest.tsf(1)

NAME

ERIS_ifs_tec_FunctionalTest.tsfx - IFS Technical Template

6.7.8 ERIS_ifs_tec_GainLinearity.tsf(1)

NAME

ERIS_ifs_tec_GainLinearity.tsfx - IFS Technical Template

6.7.9 ERIS_ifs_tec_GenExposure.tsf(1)

NAME

ERIS_ifs_tec_GenExposure.tsfx - Take generic exposures with ERIS/SPIFFIER

SYNOPSIS

Template to take exposures with SPIFFIERS while obeying persistence data recording

DESCRIPTION

Take one or SEQ.NEXPO exposures at a single SPIFFIER setting.

The template starts and ends with a "closed" filter position. To define the filter position for the exposures at least one of
INS.BAND.NAME or
INS.SPFW.NAME or
INS.SPFW.ENC must be specified.

If no pre-optics wheel position is given the current position will be used. If no grating wheel position nor INS.BAND.NAME is given the current position will be used.

Encoder positions will overwrite named positions.
INS.BAND.NAME will overwrite filter and grating wheel settings.

Processing steps:
- If INS.SPXW.ENC is not "-1000"
  prepare to set pre-optics wheel to INS.SPXW.ENC
- else if INS.SPXW.NAME is not empty
  prepare to set pre-optics wheel to INS.SPXW.NAME

- If INS.BAND.NAME is not empty
  prepare to set INS.MODE assembly which will set filter and grating wheel
- else
  - if INS.SPGW.ENC is not "-1000"
    prepare to set grating wheel to INS.SPGW.ENC
  - else if INS.SPGW.NAME is not empty

[1]Last change: 2024-02-01 17:54

```
      prepare to set grating wheel to INS.SPGW.NAME

    - if INS.SPFW.ENC is not "-1000"
      prepare to set filter wheel to INS.SPFW.ENC
    - else if INS.SPFW.NAME is not empty
      prepare to set filte wheel to INS.SPFW.NAME

- if INS.SPXW.ENC or INS.SPXW.NAME is set then move pre-optics wheel
- if INS.BAND.NAME is not set but either INS.SPGW.ENC or INS.SPGW.NAME
                                          then move grating wheel
- start persitence recording
- if INS.BAND.NAME is not set but either INS.SPFW.ENC or INS.SPFW.NAME
                                          then move filter wheel
- if INS.BAND.NAME is set then move both filter and grating wheel
- take TPL.NEXP exposures
- close filter wheel while taking persistence data
```

6.7.10 ERIS_ifs_tec_NorthSouth.tsf(1)

NAME

```
ERIS_ifs_tec_NorthSouth.tsfx - IFS Technical Template
```

6.7.11 ERIS_ifs_tec_QuickHealthChk.tsf(1)

NAME

```
ERIS_ifs_tec_QuickHealthChk.tsfx - IFS Technical Template
```

6.8 ERIS Technical Templates - Imaging (NIX)

6.8.1 ERIS_nixIMG_tec_CheckDistortion.tsf(1)

NAME

```
ERIS_nixIMG_tec_CheckDistortion.tsfx--check stability of distortion with fixed
                                     aperture wheel at Pinholes
```

SYNOPSIS

```
Template for checking stability of distortion with fixed ApertureWheel at Pinholes
```

DESCRIPTION

```
Using Pinhole mask in the aperture wheel, check stability of distortion - once a
month as health check distortion.

1) setup ERIS using CU/Qth Lamp for NIX, set all NIX wheels internal
   positions based on[camera-NXCW, pupil-NXPW, filter-NXFW]
2) reset NXAW to Pinholes ( WT requested)
```

[1]Last change: 2024-02-01 17:54

```
 3) set AO focus offset and extra FITS Key words needed
 4) read all wheels positions from OLDB; check against internal ones
    (include ImageSelector-NXIS), return check result ==> chkRslt
 5) prepare all parameters (full window) for persistence data recording
 6) {
      asynchronous move
         NIX to user asked position if not there
         phmzPos and QTH lamp on
      record persistence data if doPersistFlag=T
    }
 7) {
      setup DET parameters for exposure
      start "No of exposures"
    }
 8) anything goes wrong, End Persistence recording if doPersistFlag=T
 9) move NXIS => DARK; CU Lamp off
10) exit
```

6.8.2 ERIS_nix_tec_CheckInternalFocus.tsf(1)

NAME

ERIS_nix_tec_CheckInternalFocus.tsfx---check internal NIX focus in IMG mode

SYNOPSIS

Template for checking internal NIX focus in IMG mode

DESCRIPTION

This is used to set the internal NIX detector focus for JHK and LM. It will involve imaging the distortion mask in NIX and moving the NIX detector focus stage mechanism (linear). This will work for all wavebands as we can use the calibration source for JHK and thermal emission through the distortion mask in LM. The instrument will behave in the same way - only the exposure time might be a bit longer for LM. The image data is then analysed to determine the best detector focus position.

```
1) setup ERIS using CU/Qth Lamp for NIX, set all NIX wheels internal
   positions based on[camera-NXCW, pupil-NXPW, filter-NXFW]
2) reset NXAW to user's choice ( WT requested)
3) set AO focus offset and extra FITS Key words needed
4) read all wheels positions from OLDB; check against internal ones
   (include ImageSelector-NXIS), return check result ==> chkRslt
5) prepare FocusStage-NXDF step list
6) prepare all parameters (full window) for persistence data recording
7) {
    asynchronous move
       NIX to user asked position if not there
       phmzPos and QTH lamp on
     record persistence data if doPersistFlag=T
  }
```

[1]Last change: 2024-02-01 17:54

```
 8) loop through each NXDF step and take expposures
    {
      set extra FITS Key words needed
      move NXDF to its step position
      record persistence data if doPersistFlag=T

      setup DET parameters for exposure
      start "No of exposures"
    }
 9) anything goes wrong, End Persistence recording if doPersistFlag=T
10) move NXIS => DARK; CU Lamp off
11) exit
```

6.8.3 ERIS_nix_tec_CheckPupil.tsf(1)

NAME

```
ERIS_nix_tec_CheckPupil.tsfx---check if the spider mask in the NIX pupil wheel
                               is lined up with the spider
```

SYNOPSIS

```
Template for checking if the spider mask in the NIX pupil wheel is lined up with the spider
```

DESCRIPTION

```
This template takes an image of the pupil to checks that the spider mask
in the NIX pupil wheel is lined up with the spider and that the pupil is
aligned with the instrument.

1) set all NIX wheels internal positions based on
   [apertur=nxaw, camera-NXCW, filter-NXFW,pupil-NXPW, imageSelector="Pupil", FocusStage-NXDF]
2) set extra FITS Key words needed, set aoFoffset from user choice
3) read all wheels positions from OLDB; check against internal ones
   (exclude ImageSelector-NXIS), return check result ==> chkRslt
4) check if NXIS is in DARK position ==> nxisClosed
5) prepare all parameters (full window) for persistence data recording
6) if {nxisClosed == "F" }
   {
      move NXIS to DARK, others to user asked position if not there
      plus AOFoffset while recording persistence data
   } else  {
      move others to user asked if not there, plus AOFoffset
   }
7) we are in DARK, open "shutter", stake exposures
   {
      Start Persistence recording (full window)
      move NXIS from DARK to Pupil Position
      End Persistence recoding

     setup DET parameters for exposure
     start "No of exposures"
```

[1]Last change: 2024-02-01 17:54

```
   }
 8) anything goes wrong, End Persistence recording
 9) Start Persistence recording (full window)
10) move NXIS => DARK;
11) End Persistence recording
12) exit
```

6.8.4 ERIS_nix_tec_FibreFocus.tsf(1)

NAME

ERIS_nix_tec_FibreFocus.tsfx-- align the whole of NIX to ERIS using CU

SYNOPSIS

Template for aligning the whole of NIX to ERIS using CU

DESCRIPTION

NIX has built in mechanical mechanism. By adjusting its mount, NIX's position can be turned mechanically to best focus. A set of images are taken while CU's fiber stage mechanism is moved through its nominal focus position sequentially.

to find the best fiber focus position, we do the similar as for ERIS_nix_tec_CheckInternalFocus but this time only move PHMZ. The image data is then analysed to determine the best focus position. The analysis is used to determine how much to move NIX so the best focus is achieved with the CU fibre in its nominal position. A few iterations may be needed to achieve this.

In NIX case the CU fibre position is guaranteed to be the same as the nominal fibre position achieved when the CU and AO systems were aligned.

```
1) setup ERIS using CU/fiber Lamp for NIX, set all NIX wheels internal
   positions based on[camera-NXCW, pupil-NXPW, filter-NXFW]
2) set extra FITS Key words needed
3) read all wheels positions from OLDB; check against internal ones
   (include ImageSelector-NXIS), return check result ==> chkRslt
4) prepare FocusStage-PHMZ NoOfStep from (MAX-MIN)/Step
5) save current PHMX/PHMY/PHMZ named Position => orgPHMX/orgPHMY/orgPHMZ
6) prepare all parameters (full window) for persistence data recording
7) {
    asynchronous move
       NIX to user asked position if not there
       phmzPos phmXYPos and LSLD lamp on
     record persistence data if doPersistFlag=T
  }

8) loop through each PHMZ step and take expposures
   {
      move PHMZ to its step position
      record persistence data if doPersistFlag=T

      setup DET parameters for exposure
```

[1]Last change: 2024-02-01 17:54

```
      start "No of exposures"
    }
9) anything goes wrong, End Persistence recording if doPersistFlag=T
10) move NXIS => DARK; CU LDLS Lamp off, restore PHMX/PHMy/PHMZ position
11) exit
```

6.8.5 ERIS_nix_tec_FreeSetup.tsf(1)

NAME

```
ERIS_nix_tec_FreeSetup.tsfx - NIX tec template
```

6.8.6 ERIS_nix_tec_FunctionalTest.tsf(1)

NAME

```
ERIS_nix_tec_FunctionalTest.tsfx--Performs function check of the NIX system
```

SYNOPSIS

```
Template for performing a function check of NIX.
```

DESCRIPTION

```
perform a thorough test of all sub-subsystem functions in (possibly) all configurations
e.g. all mechanism positions. It is meant to be used occasionally,
e.g. after dismounting/re-mounting of the instrument or sub-system. It can take some time
to complete, longest list item=20

1) prepare list{NXAW/NXCW/NXDF/NXIS/NXFW/NXPW} => NoOfItem (longest)
   reuse the last iteam in the list if it is shorter than NoOfItem

2) lopp through NoOfItem
   {
      move to ithAW ithCW ithDF ithIS ithFW ithPW
   }
3) exit
```

6.8.7 ERIS_nix_tec_GainLinearity.tsf(1)

NAME

```
ERIS_nix_tec_GainLinearity.tsfx--computes the detector gain (e-/ADU)/ map the
                                 linearity of the detector through its full
                                 range of flux in JHK band.
```

SYNOPSIS

[1]Last change: 2024-02-01 17:54

[1]Last change: 2024-02-01 17:54

```
Template for computing the detector gain (e-/ADU)/ map the linearity of the detector
through its full range of flux in JHK band
```

DESCRIPTION

```
This template computes the detector gain (e-/ADU)/ map the linearity of the detector
through its full range of flux. It will take a series of lamp-on/lamp-off pairs with
the same exposure time (NDIT*DIT) and illumination with DIT progressing from the minimum
allowed to saturation. Roughly 20 lamp flats are needed.

Similar to ERIS_nixIMG_cal_LampFlats but with specific DIT range.
1) setup ERIS using CU/Qth Lamp for NIX, set all NIX wheels internal
   positions based on [ camera-NXCW[13mas-JHK], pupil-NXPW, filter-NXFW,
   ImageSelector-NXIS[13mas-JHK],aperture-NXAW[Large]
3) set AO focus offset from user choice and extra FITS Key words needed
4) read all wheels positions from OLDB; check against internal ones
   (exclude ImageSelector-NXIS), return check result ==> chkRslt
5) prepare list [DIT/NDIT]
6) prepare all parameters (full window) for persistence data recording
7) {
     if nxisClosed== "F"
        NXIS to DARK, others to $chkRslt
        record persistence data if doPersistFlag=T
   }
8) loop through each DIT/NDIT and take DARK exposures
   {
      setup DET parameters for exposure
      start "No of exposures"
   }
9) {
     phmzPos and QTH lamp on; wait 2 seconds
     if nxisClosed== "T"
        NXIS to userAskPos, others to $chkRslt,
     else
        NXIS to userAskPos,
     record persistence data if doPersistFlag=T

   }
10) loop through (ramp up) each DIT/NDIT and take normal exposures
   {
      setup DET parameters for exposure
      start "No of exposures"
   }
 11) loop through (ramp down) each DIT/NDIT and take normal exposures
   {
      setup DET parameters for exposure
      start "No of exposures"
   }
12) anything goes wrong, End Persistence recording if doPersistFlag=T
13) move NXIS => DARK; CU Lamp off
14) exit
```

6.8.8 ERIS_nix_tec_GenExposure.tsf(1)

NAME

[1]Last change: 2024-02-01 17:54

ERIS_nix_tec_GenExposure.tsfx - Take exposures with NIX, user setup all mechanism

SYNOPSIS

Template to take exposures with NIX, user setup all mechanism
with option to record persistence data and close NIX "shutter" at the end

DESCRIPTION

TakeSEQ.NEXPO exposures with all NIX mechanism setup by user.

The template has default to FAST,no CUBE readout mode; has options
to record persistence data and close NIX "shutter" at the end

6.8.9 ERIS_nix_tec_MeasureVibes.tsf(1)

NAME

ERIS_nix_tec_MeasureVibes.tsfx-- monitor vibration in JHK band

SYNOPSIS

Template for performing a vibration measurement for NIX in JHK band.

DESCRIPTION

This template takes data in 'cube' mode. For a bright target, the high
time resolution of the cube data would let us see if the image is moving
around on the detector.

1) setup ERIS using CU/fiber Lamp for NIX, set all NIX wheels internal
   positions based on[camera-NXCW, pupil-NXPW, filter-NXFW]
2) set AO focus offset and extra FITS Key words needed
3) read all wheels positions from OLDB; check against internal ones
   (include ImageSelector-NXIS), return check result ==> chkRslt
4) save current PHMX/PHMY/PHMZ named Position => orgPHMX/orgPHMY/orgPHMZ
5) prepare all parameters (full window) for persistence data recording
6) {
     asynchronous move
        NIX to user asked position if not there
        phmzPos phmXYPos and LSLD lamp on
      record persistence data if doPersistFlag=T
   }
7) {
      setup DET parameters for exposure
      start "No of exposures"
   }
8) anything goes wrong, End Persistence recording if doPersistFlag=T
9) move NXIS => DARK; CU LDLS Lamp off,restore PHMX/PHMy/PHMZ position
10) exit

[1]Last change: 2024-02-01 17:54

6.8.10 ERIS_nix_tec_QuickHealthChk.tsf(1)

NAME

```
ERIS_nix_tec_QuickHealthChk.tsfx--Performs a quick health check of the NIX system
```

SYNOPSIS

```
Template for performing a quick health check of NIX.
```

DESCRIPTION

```
perform a basic check on the quality of the point source.

for a subset of the sub-system functions. e.g.
( NXAW ["Pinholes" ],  NXCW ["27mas-JHK"], NXPW ["Blocking"], NXIS ["27mas-JHK"],
NXDF ["E-cam2-D" ], NXFW [ "Ks"]); take one image. The result image is
analysed by a python script, the outputis either "Passed quality check" or
"The point source might be out of focus". It is meant to be performed daily,
e.g. before starting operations. It shouldn't take much time to complete.

1) setup ERIS using CU/Qth Lamp for NIX, set all NIX wheels internal
   positions from fixed nixWheelLastPos array
2) set extra FITS Key words needed
3) read all wheels positions from OLDB; check against internal ones
   (include ImageSelector-NXIS), return check result ==> chkRslt
4) prepare all parameters (full window) for persistence data recording
5) {
     asynchronous move
        NIX to user asked position if not there
        phmzPos and QTH lamp on
     record persistence data if doPersistFlag=T
   }
6) {
      setup DET parameters for exposure
      start "No of exposures"
      record the latest FitsFileName  ===> fileName
    }
 7) anything goes wrong,
     CU Lamp off End Persistence recording if doPersistFlag=T
 8)
 9) move NXIS => DARK; CU Lamp off,Persistence recording if doPersistFlag=T

10) if {NIX detector ==LU-SIM} { fileName = simulated Fits file }
11) run python script "ermseqNIXQuickHealthChk.py fileName"
    display result on terminal
12) exit
```

6.8.11 ERIS_nix_tec_Test.tsf(1)

NAME

```
ERIS_nix_tec_Test.tsfx - NIX tec template
```

[1]Last change: 2024-02-01 17:54

6.9 ERIS Techincal Templates - AO

6.9.1 ERIS_ao_obs_LaserLeakage.tsf(1)

NAME

```
ERIS_ao_obs_LaserLeakage.tsfx--- ao observing template
```

SYNOPSIS

```
Template for checking laser leakage on AO LO channel
```

DESCRIPTION

```
1) Open the LO loop and truth sensing if they were closed, move to X,Y = 0,0, set gain to 400 a
2) Save a full TN
3) Configure SPARTA recorder to record T seconds of LGSPix, LGSLoop, LOPix, LOLoop data
4) Loop on spiral step from 0 to N:
    4.1) Start recording T seconds of LGSPix, LGSLoop, LOPix, LOLoop data and move files in TN
    4.2) Detune the laser
    4.3) Start recording T seconds of LGSPix, LGSLoop, LOPix, LOLoop data and move files in TN
    4.4) Stop propagation of laser
    4.5) Start recording T seconds of LGSPix, LGSLoop, LOPix, LOLoop data and move files in TN
    4.6) Retune the laser and restart propagation
    4.7) Go to next step of spiral
```

6.9.2 ERIS_ao_tec_ChangeDefaultLGS.tsf(1)

NAME

```
ERIS_ao_tec_ChangeDefaultLGS.tsfx - Changes the default value of the SEQ.LGS keyword
```

DESCRIPTION

```
This templates changes the default value of the SEQ.LGS keyword,
which identifies the laser beacon used for LGS operation on-sky.
Acquisition templates will use the default laser unless otherwise specified.
```

6.9.3 ERIS_ao_tec_DsmFlatteningCmd.tsf(1)

NAME

```
ERIS_ao_tec_DsmFlatteningCmd.tsfx - Saves a reference flat for the DSM.
```

DESCRIPTION

[1]Last change: 2023-07-25 17:57
[1]Last change: 2024-02-01 17:54
[1]Last change: 2024-02-01 17:54

```
This template is used to save a reference flat for the DSM.
A series of DSM command frames are read from SPARTA, averaged, and saved
as a "flat" file for future use. The standard deviation for each actuator
is also computed. Average and standard deviation data are saved into
long-term storage to be able to compute historical trends.
In order to have a good measurement quality, when this template
is run the AO NGS loop must be closed on a bright star (7<mag_R<10),
at a low zenith angle (<15 degrees) and with the highest possible
number of controlled modes.
```

6.9.4 ERIS_ao_tec_Engineering.tsf(1)

NAME

```
ERIS_ao_tec_Engineering.tsfx - ERIS AIV template
```

DESCRIPTION

```
This template is intended for AIV test code that must run under BoB.
Whether it will be keep after commissioning is TBD.
```

6.9.5 ERIS_ao_tec_FreeSetup.tsf(1)

NAME

```
ERIS_ao_tec_FreeSetup.tsfx - ERIS test and maintenance template
```

DESCRIPTION

```
Allows to set all ERIS devices (AO, CU, NIX and SPIFFIER)
to arbitrary positions.
```

6.9.6 ERIS_ao_tec_FunctionalTest.tsf(1)

NAME

```
ERIS_ao_tec_FunctionalTest.tsfx - Moves all NGS WFS and LGS WFS devices
                                  and verifies their correct functionality.
```

DESCRIPTION

```
This template moves all NGS WFS and LGS WFS devices and verifies
their correct functionality.
```

EXAMPLES

```
In trunk folder ERIS/MS/ermait/src/TECH_TEMPLATES_OBDS an example is:
ermait_tec_FunctionalTest.obd
```

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[1]Last change: 2024-02-01 17:54

6.9.7 ERIS_ao_tec_IfsDiffFlexures.tsf(1)

NAME

```
ERIS_ao_tec_IfsDiffFlexures.tsfx - Measures the differential mechanical
                                   flexures between the AO NGS
                                   sensor and the SPIFFIER instrument.
```

DESCRIPTION

```
This template measures the differential mechanical flexures between the AO
NGS sensor and the SPIFFIER instrument, using a reference CU source,
a list of telescope positions (elevation and instrument rotator) is read
from a configuration file, the first being a reference position
(zenith and zero rotation). Before starting, a SPIFFIER dark frame is taken.
At each position, telescope is preset, a SPIFFIER image is taken, and a
number of NGS pixel frames are saved from the NGS HO pipeline.
After all positions have been saved, data is analyzed offline in order
to build a model of the flexures between AO and NIX, that will be used
during night-time operation.
```

CAUTIONS

```
MAIV not for Paranal but only to be run on telescope simulator
```

EXAMPLES

```
In trunk folder ERIS/MS/ermait/src/TECH_TEMPLATES_OBDS an example is:
ermait_tec_SpiffierDiffFlexures_ESOsource.obd
```

6.9.8 ERIS_ao_tec_IfsNCPA.tsf(1)

NAME

```
ERIS_ao_tec_IfsNCPA.tsfx - Measures the Non-Common Path Aberrations
                           between the AO NGS sensor and the SPIFFIER instrument.
```

DESCRIPTION

```
This template calibrates the NCPA vector that results in the best possible SPIFFIER PSF.

The template applies a single mode as a modal offset to the AO loop,
iterating over an user-defined range, and saves a SPIFFIER image at each step.
Once the iteration is completed, all images are analyzed to determine
the modal offset value resulting in the best PSF, and this value
is saved as the reference NCPA value for that mode.
```

CAUTIONS

[1]Last change: 2024-02-01 17:54

[1]Last change: 2024-02-01 17:54

```
The measurement must be performed in closed loop, and separate measurements
must be performed for NGS, LGS and SE AO modes.

At Paranal off-telescope with DSM simulator. On-sky with reduced sensitivity.
```

EXAMPLES

```
In trunk folder ERIS/MS/ermait/src/TECH_TEMPLATES_OBDS an example is:
ermait_tec_SpiffierNCPA_LGS.obd,  ermait_tec_SpiffierNCPA_LO.obd,
ermait_tec_SpiffierNCPA_NGS.obd
```

6.9.9 ERIS_ao_tec_LGS_CUtiptiltIM.tsf(1)

NAME

```
ERIS_ao_tec_LGS_CUtiptiltIM.tsfx - Measures the Interaction Matrix between
                                   the PHMX and Y movements and the AO
                                   tip-tilt signal on the LGS wavefront sensor
```

DESCRIPTION

```
This template measures the Interaction Matrix between the PHMX and Y movements
and the AO tip-tilt signal on the LGS wavefront sensor.
After the measurement, it generates and saves a 2x2 reconstructor matrix
which can be used to adjust the PHMX/Y position based on the AO tip-tilt signal.
This matrix is intended to be used during the execution of the
differential flexures and NCPA templates.
```

EXAMPLES

```
In trunk folder ERIS/MS/ermait/src/TECH_TEMPLATES_OBDS an example is:
ermait_tec_LGS_CUtiptiltIM_SPIFFIER.obd
ermait_tec_LGS_CUtiptiltIM_NIX.obd
```

6.9.10 ERIS_ao_tec_LGSCcdDark.tsf(1)

NAME

```
ERIS_ao_tec_LGSCcdDark.tsfx - Measures a series of dark frames on the LGS camera
```

DESCRIPTION

```
Measure a series of dark frames on the LGS WFS camera, one for each possible DIT.
Dark frames are stored on disk and will be used in the AO acquisition sequence.
The list of possible DITs is automatically determined scanning the AO configuration tables.
```

CAUTIONS

[1]Last change: 2024-02-01 17:54

[1]Last change: 2024-02-01 17:54

Calibration lost after software rebuilding

EXAMPLES

In trunk folder ERIS/MS/ermait/src/TECH_TEMPLATES_OBDS an example is:
ermait_tec_LGSCcdDark.obd

6.9.11 ERIS_ao_tec_LGSCcdGain.tsf(1)

NAME

ERIS_ao_tec_LGSCcdGain.tsfx - Measures the ADU/electron ratio of the LGS camera

DESCRIPTION

This template measures the ADU/electron ratio of the LGS wavefront sensor.
After setting the specified CU configuration and camera gains,
it iterates over a series of NGS framerates, saving a series of pixel frames
at each point using the SPARTA pixel recorder. At the end, a data analysis
routine computes the ADU/electron ratio for each of the 8 CCD quadrants.

EXAMPLES

In trunk folder ERIS/MS/ermait/src/TECH_TEMPLATES_OBDS an example is:
ermait_tec_LGSCcdGain.obd

6.9.12 ERIS_ao_tec_LGSCcdRon.tsf(1)

NAME

ERIS_ao_tec_LGSCcdRon.tsfx - Measures the Read-Out Noise of the LGS camera.

DESCRIPTION

This template measures the Read-Out Noise of the LGS wavefront sensor.
The measurement is performed at the specified camera EM gain,
blocking the light by setting the NGFW in BLOCK position and using the
SPARTA pixel recorder to read a series of pixel frames.
Data is processed in order to calculate an average standard deviation value,
which is then converted into electrons and saved into FITS logs.

EXAMPLES

In trunk folder ERIS/MS/ermait/src/TECH_TEMPLATES_OBDS an example is:
ermait_tec_LGSCcdRon.obd

[1]Last change: 2024-02-01 17:54
[1]Last change: 2024-02-01 17:54

6.9.13 ERIS_ao_tec_LGSCheckPupil.tsf(1)

NAME

```
ERIS_ao_tec_LGSCheckPupil.tsfx - Performs a pupil check of the AO system.
```

DESCRIPTION

```
Performs a pupil check of the AO system already in closed loop
It does NOT setup any configuration.

* Gets the list of VALID subaps from SPARTA.

* Verifies that exactly all VALID subaps are well illuminated
```

EXAMPLES

```
In trunk folder ERIS/MS/ermait/src/TECH_TEMPLATES_OBDS an example is:
ermait_tec_CheckPupilLGS.obd and ermait_tec_CheckPupilNGS.obd
```

6.9.14 ERIS_ao_tec_LGSFieldStop.tsf(1)

NAME

```
ERIS_ao_tec_LGSFieldStop.tsfx - Checks the LGS field vignetting, moving
                                the CU source in steps across the
                                field of view on a grid.
```

DESCRIPTION

```
Checks the LGS field vignetting, moving the CU source in steps across
the field of view on a grid. A linear motion on a single axis
can be obtained setting the START and STOP values to the same value
for the other axis. At each grid point, a series of pixel and
slope frames are read and averaged form the LGS detector using
the SPARTA pixel and loop recorders.
```

EXAMPLES

```
In trunk folder ERIS/MS/ermait/src/TECH_TEMPLATES_OBDS an example is:
ermait_tec_LGSFieldStop.obd
```

6.9.15 ERIS_ao_tec_LGSFocus.tsf(1)

NAME

```
ERIS_ao_tec_LGSFocus.tsfx - Measures LGS focus stage position that
                            maximizes the PSF strehl ratio on NIX or SPIFFIER
```

[1]Last change: 2024-02-01 17:54
[1]Last change: 2024-02-01 17:54
[1]Last change: 2024-02-01 17:54

DESCRIPTION

Measures LGS focus stage position that maximizes the PSF strehl ratio
on NIX or SPIFFIER. The measurement is done in closed loop, acquiring
a series of PSFs from NIX or SPIFFIER, moving the LGS focus stage
in steps over a configurable range. After the acquisition, the best focus
position is identified and optionally saved on disk as the reference focus
position for SE mode

CAUTIONS

System must be in AO closed loop in SE mode, otherwise the LGS focus stage
movement will have no effect.

EXAMPLES

In trunk folder ERIS/MS/ermait/src/TECH_TEMPLATES_OBDS an example is:
ermait_tec_LGSFocus_NIX.obd and ermait_tec_LGSFocus_SPIFFIER.obd

6.9.16 ERIS_ao_tec_LGSNGCGain.tsf(1)

NAME

ERIS_ao_tec_LGSNGCGain.tsfx - Measures gain of the LGS wavefront sensor.

DESCRIPTION

This template measures the gain of the LGS wavefront sensor.
After setting the specified CU and AO configuration,
it executes the ngcdcsExpDrv script

EXAMPLES

In trunk folder ERIS/MS/ermait/src/TECH_TEMPLATES_OBDS an example is:
ermait_tec_LGSNGCGain.obd

6.9.17 ERIS_ao_tec_LGSPerfScan.tsf(1)

NAME

ERIS_ao_tec_LGSPerfScan.tsfx - Perform perfomance mode scannning for commissioning

DESCRIPTION

Changes SPARTA frequency, number of modes, weight masks, and NGIR position to
test different condition during commissioning tests. At every step saves a TN
and perform a NIX or SPIFFIER exposure.

EXAMPLES

In trunk folder ERIS/MS/ermait/src/TECH_TEMPLATES_OBDS an example is:
ermait_tec_LGSPerfScan_NIX.obd and ermait_tec_LGSPerfScan_SPIFFIER.obd

[1]Last change: 2024-02-01 17:54
[1]Last change: 2024-02-01 17:54

6.9.18 ERIS_ao_tec_LGSPmPsf.tsf(1)

NAME

ERIS_ao_tec_LGSPmPsf.tsfx - Measures the PSF and pupil displacements due to the LGPM movement.

DESCRIPTION

This template measures the PSF and pupil displacements due to the LGPM movement.
It then outputs the PSF and pupil interaction matrices and their control matrices (CM).
The pupil CM will be used by the LGS Pupil auxiliary loop, while the PSF IM
has no immediate use.
Optionally, the templates checks that the PSF movement is below a specified
threshold, and gives an error if so.

EXAMPLES

In trunk folder ERIS/MS/ermait/src/TECH_TEMPLATES_OBDS an example is:
ermait_tec_LGSPmPsf_CU.obd

6.9.19 ERIS_ao_tec_LGSRefSlopes.tsf(1)

NAME

ERIS_ao_tec_LGSRefSlopes.tsfx - Measures and stores the LGS WFS reference slopes.

DESCRIPTION

This templates calibrates the LGS reference slopes
with the following algorithm:

* Sets a reference position using the CU
* Rotates the K-mirror in steps and, at each step:
  * saves a dataset with pixels and slopes from SPARTA, and time-average this data

Once a full K-mirror rotation has been completed, all slopes
are averaged across the rotation.

The averaged slopes are saved as the new LGS reference slopes, that are uploaded
to the SPARTA CDMS and optonally saved on disk.

EXAMPLES

In trunk folder ERIS/MS/ermait/src/TECH_TEMPLATES_OBDS an example is:
ermait_tec_LGSRefSlopes.obd

[1]Last change: 2024-02-01 17:54
[1]Last change: 2024-02-01 17:54

6.9.20 ERIS_ao_tec_LGSRotShWobble.tsf(1)

NAME

```
ERIS_ao_tec_LGSRotShWobble.tsfx - Measures the PSF and pupil offset
                                  introduced by the LGRT movement in
                                  the LGS wavefront sensor.
```

DESCRIPTION

```
This template measures the PSF and pupil offset introduced by the LGRT
movement in the LGS wavefront sensor. The LGRT is moved in steps,
and at each step a series of slope frames are saved from SPARTA using
the loop recorder. The LGS sensor is unable to correct for PSF offset,
so the measurement will give an information of how much the PSF will move
during observations.

Optionally, the template can close the auxiliary loop
for pupil compensation. In this case, the pupil offset cannot be measured,
and the LGPM command that is executing the pupil compensation is reported instead.
```

EXAMPLES

```
In trunk folder ERIS/MS/ermait/src/TECH_TEMPLATES_OBDS an example is:
ermait_tec_LGSRotShWobble_CU.obd
```

6.9.21 ERIS_ao_tec_LGSWFSZStageRepeatability.tsf(1)

NAME

```
ERIS_ao_tec_LGSWFSZStageRepeatability.tsfx - Measures the focus stage repeatability
                                             in positioning the WFS board for
                                             the LGS acquisition.
```

DESCRIPTION

```
The template is used to measure the focus stage repeatability in positioning
the WFS board for the LGS acquisition.  The CU source is kept fixed throughout
this test. The source is acquired on LGS WFS through the usage of
LGS_ONAXIS_CU assembly and centered in the WFS
(until Tip, Tilt and focus signal is null). The initial optimal positions of
the the stage is then recorded. In this initial optimal conditions a loop
recording is started and a FITS file with a complete header is saved.
The initial values are added to the header. The repeatability measurement is
then started and, at every iteration of the measurement, the i-index positions
 of the out-movements lists passed as template parameter is setup for the stage.
At the end of each iteration (back to initial position), a loop recorder
is started and a FITS file with a complete header is saved so that the Zernike
Tip, Tilt and Focus repositioning error are stored in the header
The template finally checks that all the collected Tip/Tilt/Focus (i.e. TTF)
error values are within a pre-defined threshold.
```

[1]Last change: 2024-02-01 17:54
[1]Last change: 2024-02-01 17:54

EXAMPLES

In trunk folder ERIS/MS/ermait/src/TECH_TEMPLATES_OBDS an example is:
ermait_tec_LGSWFSZStageRepeatability.obd

6.9.22 ERIS_ao_tec_LOFocus.tsf(1)

NAME

ERIS_ao_tec_LOFocus.tsfx - Measures NGS focus stage position in LGS mode
(LO channel) that maximizes the PSF strehl ratio
on NIX or SPIFFIER.

DESCRIPTION

Measures NGS focus stage position in LGS mode (LO channel) that maximizes
the PSF strehl ratio on NIX or SPIFFIER.
The measurement is done in closed loop, acquiring a series of PSFs
from NIX or SPIFFIER, moving the NGS focus stage in steps over
a configurable range. After the acquisition, the best focus position
is identified and optionally saved on disk as the reference focus position for LO mode.

CAUTIONS

System must be in AO closed loop in Full LGS mode, otherwise the NGS focus stage
movement will have no effect.

EXAMPLES

In trunk folder ERIS/MS/ermait/src/TECH_TEMPLATES_OBDS an example is:
ermait_tec_LOFocus_NIX.obd and ermait_tec_LOFocus_SPIFFIER.obd

6.9.23 ERIS_ao_tec_LORefSlopes.tsf(1)

NAME

ERIS_ao_tec_LORefSlopes.tsfx - Measures and stores the LO WFS reference slopes

DESCRIPTION

This templates calibrates the LO reference slopes and weighting masks
with the following algorithm:

* Sets a reference position using the CU
* Rotates the K-mirror in steps and, at each step:
  * saves a dataset with pixels and slopes from SPARTA, and time-average this data
  * compute the spots center in the pixel data using the CLIP function ImageMultiCenterGauss

[1]Last change: 2024-02-01 17:54
[1]Last change: 2024-02-01 17:54

Once a full K-mirror rotation has been completed, all slopes and
all spot center positions are averaged across the rotation.

The averaged slopes are saved as the new LO reference slopes.
The averaged spots centers are used as the center position for a new set
of top-hat weighting masks with diameter variable from 3 to 12 pixels.

This data is uploaded to the SPARTA CDMS.

EXAMPLES

In trunk folder ERIS/MS/ermait/src/TECH_TEMPLATES_OBDS an example is:
ermait_tec_LORefSlopes.obd

6.9.24 ERIS_ao_tec_LORotShWobble.tsf(1)

NAME

ERIS_ao_tec_LORotShWobble.tsfx - Measure PSF and pupil offset due to NGS derotator

DESCRIPTION

This template measures the PSF and pupil offset introduced by the NGRT
movement in the NGS wavefront sensor in LO mode. The NGRT is moved in steps,
and at each step a series of slope frames are saved from SPARTA using
the loop recorder.

6.9.25 ERIS_ao_tec_NGFPtiptiltIM.tsf(1)

NAME

ERIS_ao_tec_NGFPtiptiltIM.tsfx - Measures the Interaction Matrix between
the NGFP X and Y movements and the AO
tip-tilt signal.

DESCRIPTION

Measures the Interaction Matrix between the NGFP X and Y movements and
the AO tip-tilt signal. After the measurement, generates and saves a 2x2
reconstructor matrix which can be used to adjust the NGFP XY position based
on the AO tip-tilt signal. This matrix is used by other technical templates
to convert their AO tip-tilt measurement into an NGFP offset.

EXAMPLES

In trunk folder ERIS/MS/ermait/src/TECH_TEMPLATES_OBDS an example is:
ermait_tec_NGFPtiptiltIM.obd

[1]Last change: 2024-02-01 17:54
[1]Last change: 2024-02-01 17:54

6.9.26 ERIS_ao_tec_NGS_CUSTAGES.tsf(1)

NAME

```
ERIS_ao_tec_NGS_CUSTAGES.tsfx - Measures the Interaction Matrix between the
                                PHMX and Y movements and the AO tip-tilt
                                signal on the NGS wavefront sensor.
```

DESCRIPTION

```
This template measures the Interaction Matrix between the
PHMX and Y movements and the AO tip-tilt signal on the NGS wavefront sensor.
After the measurement, it generates and saves a 2x2 reconstructor matrix
which can be used to adjust the PHMX/Y position based on the
AO tip-tilt signal.
```

CAUTIONS

```
This matrix is intended to be used during the execution of the
differential flexures and NCPA templates.
```

EXAMPLES

```
In trunk folder ERIS/MS/ermait/src/TECH_TEMPLATES_OBDS an example is:
ermait_tec_NGS_CUSTAGES.obd
ermait_tec_NGS_CUSTAGES.obd
```

6.9.27 ERIS_ao_tec_NGS_CUtiptiltIM.tsf(1)

NAME

```
ERIS_ao_tec_NGS_CUtiptiltIM.tsfx - Measures the Interaction Matrix between the
                                PHMX and Y movements and the AO tip-tilt
                                signal on the NGS wavefront sensor.
```

DESCRIPTION

```
This template measures the Interaction Matrix between the
PHMX and Y movements and the AO tip-tilt signal on the NGS wavefront sensor.
After the measurement, it generates and saves a 2x2 reconstructor matrix
which can be used to adjust the PHMX/Y position based on the
AO tip-tilt signal.
```

CAUTIONS

```
This matrix is intended to be used during the execution of the
differential flexures and NCPA templates.
```

[1]Last change: 2024-02-01 17:54

[1]Last change: 2024-02-01 17:54

EXAMPLES

In trunk folder ERIS/MS/ermait/src/TECH_TEMPLATES_OBDS an example is:
ermait_tec_NGS_CUtiptiltIM_NIX.obd
ermait_tec_NGS_CUtiptiltIM_SPIFFIER.obd

6.9.28 ERIS_ao_tec_NGSAcDark.tsf(1)

NAME

ERIS_ao_tec_NGSAcDark.tsfx - Measures and stores on disk a series of dark frames for the Acquisition Camera.

DESCRIPTION

This template measures and stores on disk a series of dark frames for the Acquisition Camera, that will be used during the AO acquisition sequence. The list of DIT and binning configuration is automatically determined scanning the AO configuration tables, and a dark frame for each possible configuration will be stored.

CAUTIONS

Calibration lost after software rebuilding

EXAMPLES

In trunk folder ERIS/MS/ermait/src/TECH_TEMPLATES_OBDS an example is:
ermait_tec_NGSAcDark.obd

6.9.29 ERIS_ao_tec_NGSAdcShWobble.tsf(1)

NAME

ERIS_ao_tec_NGSAdcShWobble.tsfx - measures PSF and pupil offset due to ADC

DESCRIPTION

This template measures the PSF and pupil offset introduced by the ADC movement in the NGS wavefront sensor. The ADC is moved in steps, and at each step a series of slope frames are saved from SPARTA using the loop recorder. The measurement are used to build a LUT that will correct for the PSF motion during closed loop operation.

[1]Last change: 2024-02-01 17:54
[1]Last change: 2024-02-01 17:54

6.9.30 ERIS_ao_tec_NGSCcdDark.tsf(1)

NAME

ERIS_ao_tec_NGSCcdDark.tsfx - Measure a series of dark frames on the NGS WFS camera.

DESCRIPTION

Measure a series of dark frames on the NGS WFS camera, one for each possible DIT.
Dark frames are stored on disk and will be used in the AO acquisition sequence.
The list of possible DITs is automatically determined scanning the AO configuration tables.

6.9.31 ERIS_ao_tec_NGSCcdGain.tsf(1)

NAME

ERIS_ao_tec_NGSCcdGain.tsfx - Measures the ADU/electron ratio of the NGS wavefront sensor.

DESCRIPTION

This template measures the ADU/electron ratio of the NGS wavefront sensor.
After setting the specified CU configuration and camera gains,
it iterates over a series of NGS framerates, saving a series of pixel
frames at each point using the SPARTA pixel recorder. At the end,
a data analysis routine computes the ADU/electron ratio
for each of the 8 CCD quadrants.

EXAMPLES

In trunk folder ERIS/MS/ermait/src/TECH_TEMPLATES_OBDS an example is:
ermait_tec_NGSCcdGain.obd

6.9.32 ERIS_ao_tec_NGSCcdRon.tsf(1)

NAME

ERIS_ao_tec_NGSCcdRon.tsfx - Measures the Read-Out Noise of the NGS wavefront sensor.

DESCRIPTION

This template measures the Read-Out Noise of the NGS wavefront sensor.
The measurement is performed at the specified camera EM gain,
blocking the light by setting the NGFW in BLOCK position and using the
SPARTA pixel recorder to read a series of pixel frames. Data is processed
in order to calculate an average standard deviation value, which is then
converted into electrons and saved into FITS logs.

EXAMPLES

In trunk folder ERIS/MS/ermait/src/TECH_TEMPLATES_OBDS an example is:
ermait_tec_NGSCcdRon.obd

[1]Last change: 2024-02-01 17:54
[1]Last change: 2024-02-01 17:54
[1]Last change: 2024-02-01 17:54

6.9.33 ERIS_ao_tec_NGSCheckPupil.tsf(1)

NAME

```
ERIS_ao_tec_NGSCheckPupil.tsfx - Performs a pupil check of the AO system.
```

DESCRIPTION

```
Performs a pupil check of the AO system already in closed loop
It does NOT setup any configuration.

* Gets the list of VALID subaps from SPARTA.

* Verifies that exactly all VALID subaps are well illuminated
```

EXAMPLES

```
In trunk folder ERIS/MS/ermait/src/TECH_TEMPLATES_OBDS an example is:
ermait_tec_CheckPupilLGS.obd and ermait_tec_CheckPupilNGS.obd
```

6.9.34 ERIS_ao_tec_NGSFieldStop.tsf(1)

NAME

```
ERIS_ao_tec_NGSFieldStop.tsfx - Checks the NGS field vignetting, moving
                                the CU source or the NGFP stages
                                in steps across the field of view on a grid.
```

DESCRIPTION

```
Checks the NGS field vignetting, moving the CU source or the NGFP stages
(depending on the SEQ.CU parameter) in steps across the field of view on a grid.
A linear motion on a single axis can be obtained
setting the START and STOP values to the same value for the other axis.
At each grid point, a series of pixel frames
are read and averaged form the NGS detector using the SPARTA pixel recorder.
```

EXAMPLES

```
In trunk folder ERIS/MS/ermait/src/TECH_TEMPLATES_OBDS an example is:
ermait_tec_NGSFieldStop.obd
```

6.9.35 ERIS_ao_tec_NGSFocus.tsf(1)

NAME

```
ERIS_ao_tec_NGSFocus.tsfx - Measures NGS focus stage position that maximizes
                            the PSF strehl ratio on NIX or SPIFFIER.
```

[1]Last change: 2024-02-01 17:54
[1]Last change: 2024-02-01 17:54
[1]Last change: 2024-02-01 17:54

DESCRIPTION

Measures NGS focus stage position that maximizes the PSF strehl ratio on NIX or SPIFFIER.
The measurement in closed loop, acquiring a series of PSFs from NIX or SPIFFIER,
moving the NGS focus stage in steps over a configurable range.
After the acquisition, the best focus position is identified and optionally
saved on disk as the reference focus position for NGS mode.

CAUTIONS

System must be in AO closed loop in NGS mode, otherwise the NGS focus stage
movement will have no effect.

EXAMPLES

In trunk folder ERIS/MS/ermait/src/TECH_TEMPLATES_OBDS an example is:
ermait_tec_NGSFocus_NIX.obd and ermait_tec_NGSFocus_SPIFFIER.obd

6.9.36 ERIS_ao_tec_NGSNGCGain.tsf(1)

NAME

ERIS_ao_tec_NGSNGCGain.tsfx - Measures the ADU/electron ratio of the NGS wavefront sensor.

DESCRIPTION

This template measures the gain of the NGS wavefront sensor.
After setting the specified CU and AO configuration,
it executes the ngcdcsExpDrv script

EXAMPLES

In trunk folder ERIS/MS/ermait/src/TECH_TEMPLATES_OBDS an example is:
ermait_tec_NGSNGCGain.obd

6.9.37 ERIS_ao_tec_NGSPmPsf.tsf(1)

NAME

ERIS_ao_tec_NGSPmPsf.tsfx - Measures the PSF and pupil displacements due to the NGPM movement.

DESCRIPTION

This template measures the PSF and pupil displacements due to the NGPM movement.
It then outputs the PSF and pupil interaction matrices and their control matrices (CM).
The PSF CM will be used during operation to offset the NGSX+NGPE assembly, while the
pupil CM will be used by the NGS Pupil auxiliary loop.
Optionally, the templates checks that the PSF movement is below a specified
threshold, and gives an error if so.

[1]Last change: 2024-02-01 17:54
[1]Last change: 2024-02-01 17:54

EXAMPLES

```
In trunk folder ERIS/MS/ermait/src/TECH_TEMPLATES_OBDS an example is:
ermait_tec_NGSPmPsf_CU.obd
```

6.9.38 ERIS_ao_tec_NGSRefSlopes.tsf(1)

NAME

```
ERIS_ao_tec_NGSRefSlopes.tsfx - calibrates the NGS reference slopes and weighting masks
```

DESCRIPTION

```
This templates calibrates the NGS reference slopes and weighting masks
with the following algorithm:

* Sets a reference position using the CU
* Rotates the K-mirror in steps and, at each step:
   * saves a dataset with pixels and slopes from SPARTA, and time-average this data
   * compute the spots center in the pixel data using the CLIP function ImageMultiCenterGauss

Once a full K-mirror rotation has been completed, all slopes and
all spot center positions are averaged across the rotation.

The averaged slopes are saved as the new NGS reference slopes, that are uploaded
to the SPARTA CDMS and optonally saved on disk.
The averaged spots centers are used as the center position for a new set
of top-hat weighting masks with diameter variable from 3 to 12 pixels.
```

6.9.39 ERIS_ao_tec_NGSRotShWobble.tsf(1)

NAME

```
ERIS_ao_tec_NGSRotShWobble.tsfx - measures PSF and pupil offset due to the NGS derotator
```

DESCRIPTION

```
This template measures the PSF and pupil offset introduced by the NGRT
movement in the NGS wavefront sensor. The NGRT is moved in steps,
and at each step a series of slope frames are saved from SPARTA using
the loop recorder. The measurement are used to build a LUT that will
correct for the PSF motion during closed loop operation.

Optionally, the template can close the auxiliary loop
for pupil compensation. In this case, the pupil offset cannot be measured,
and the LGPM command that is executing the pupil compensation is reported instead.
```

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6.9.40 ERIS_ao_tec_NGSWFSHOLORepeatability.tsf(1)

NAME

ERIS_ao_tec_NGSWFSHOLORepeatability.tsfx - Measures the NGS WFS HO/LO stage repeatability.

DESCRIPTION

The template is used to measure the NGS WFS HO/LO stage repeatability.
The CU source is kept fixed throughout this test. The source is acquired
on NGS WFS through the usage either of NGS_ONAXIS_CU assembly to test
HO position, and LO_ONAXIS_CU to test the LO one,
and centered in the WFS (until Tip, Tilt and focus signal is null).
NGS WFS is set up for both HO and LO mode.
Due to the high overhead of switching the NGS camera from HO to LO mode
and vice versa (requiring a SPARTA reconfiguration that takes a few minutes),
the measurement is performed separately for the HO and the LO positions.
Two sets of Tip, Tilt and Focus error values measured by the NGS WFS are stored.

The switch is repeatedly flipped between HO and LO positions,
and each time it is in HO, a set of Tip, Tilt and Focus values are stored.

The procedure is then repeated setting the NGS camera in LO mode,
flipping the switch and measuring the Tip, Tilt and Focus values each time
it reaches the LO position.

The template finally checks that all the collected Tip/Tilt/Focus (i.e. TTF)
error values are within a pre-defined threshold.

EXAMPLES

In trunk folder ERIS/MS/ermait/src/TECH_TEMPLATES_OBDS an example is:
ermait_tec_NGSWFSHOLORepeatability_HO.obd
ermait_tec_NGSWFSHOLORepeatability_LO.obd

6.9.41 ERIS_ao_tec_NGSWFSStagesRepeatability.tsf(1)

NAME

ERIS_ao_tec_NGSWFSStagesRepeatability.tsfx - Measures the stages repeatability
in positioning the WFS board in the
field patrol (x,y, X-stage + periscope)
for the NGS acquisition and focus (z, focus-stage

DESCRIPTION

The template is used to measure the stages repeatability in positioning the
WFS board in the field patrol (x,y, X-stage + periscope) for the NGS acquisition
and focus (z, focus-stage). The CU source is kept fixed throughout this test.
The source is acquired on NGS WFS through the usage of NGS_ONAXIS_CU assembly
and centered in the WFS (until Tip, Tilt and focus signal is null).

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```
The initial optimal positions of the the stage is then recorded.
In this initial optimal conditions a loop recording is started and a FITS file
with a complete header is saved. The  initial values are added to the header.

The repeatability measurement is then started and, at every iteration of the measurement,
the i-index positions of the out-movements lists passed as template parameter is setup for the
At the end of each iteration (back to initial position), a loop recorder is
started and a FITS file with a complete header is saved so that the Zernike
Tip, Tilt and Focus repositioning error are stored in the header

The template finally checks that all the collected Tip/Tilt/Focus (i.e. TTF)
error values are within a pre-defined threshold.
```

EXAMPLES

```
In trunk folder ERIS/MS/ermait/src/TECH_TEMPLATES_OBDS an example is:
ermait_tec_NGSWFSStagesRepeatability_XY.obd
ermait_tec_NGSWFSStagesRepeatability_Z.obd
```

6.9.42 ERIS_ao_tec_NixDiffFlexures.tsf(1)

NAME

```
ERIS_ao_tec_NixDiffFlexures.tsfx - Measures the differential mechanical
                                   flexures between the AO NGS sensor
                                   and the NIX instrument.
```

DESCRIPTION

```
This template measures the differential mechanical flexures between the AO
NGS sensor and the NIX instrument.

Using a reference CU source, a list of telescope positions
(elevation and instrument rotator) is read from a configuration file,
the first being a reference position (zenith and zero rotation). Before starting,
a NIX dark frame is taken. At each position, telescope is preset,
a NIX image is taken, and a number of NGS pixel frames are saved from the NGS HO pipeline.
After all positions have been saved, data is analyzed offline in order to build a model of
the flexures between AO and NIX, that will be used during night-time operation.
```

CAUTIONS

```
At Paranal off-telescope with DSM simulator. On-sky with reduced sensitivity.
```

EXAMPLES

```
In trunk folder ERIS/MS/ermait/src/TECH_TEMPLATES_OBDS an example is:
ermait_tec_NixNCPA_LGS_cam1S.obd
ermait_tec_NixNCPA_LGS_cam2S.obd
ermait_tec_NixNCPA_LO_cam1S.obd
ermait_tec_NixNCPA_LO_cam2S.obd
ermait_tec_NixNCPA_NGS_cam1S.obd
ermait_tec_NixNCPA_NGS_cam2S.obd
```

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6.9.43 ERIS_ao_tec_NixNCPA.tsf(1)

NAME

```
ERIS_ao_tec_NixNCPA.tsfx - Measures the Non-Common Path Aberrations
                           between the AO NGS sensor and the NIX instrument.
```

DESCRIPTION

```
This template measures the Non-Common Path Aberrations between the AO
NGS sensor and the NIX instrument.

The template applies a single mode as a modal offset to the AO loop,
iterating over an user-defined range, and saves a NIX image at each step.
Once the iteration is completed, all images are analyzed to determine
the modal offset value resulting in the best PSF, and this value
is saved as the reference NCPA value for that mode.
```

CAUTIONS

```
The measurement must be performed in closed loop, and separate measurements
must be performed for NGS, LGS and SE AO modes.
```

6.9.44 ERIS_ao_tec_QuickHealthChk.tsf(1)

NAME

```
ERIS_ao_tec_QuickHealthChk.tsfx - Performs a quick health check
                                  of the AO system using the CU
```

SYNOPSIS

```
Template for performing a quick health check of AO.
```

DESCRIPTION

```
Performs a quick health check of the AO system using the CU:

 * Setups a reference position for all devices through assemblies
   and store preliminary pupil position [subap]

 * Centers the pupil storing the piezo mirror applied delta command:
     2.1) Verifies that piezo mirror delta command is within limits
     2.2) Verifies that average, p2V and stdev slope signal
          of well illuminated subaps is within limits

 * Removes tip/til/focus (i.e. TTF removal) by using the CU stages:
     3.1) Verifies that average, p2V and stdev slope signal
          of well illuminated subaps is within limits
     3.2) Gets the list of well illuminated subaps at reference angle
     3.3) Rotates the pupil by 45 deg and centers it back
```

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```
            (to avoid K-prism wobbling) and repeat step 3.2
        3.4) Performs an unique union of the two lists of subaps
            (to avoid underillumination due to CU spiders)
        3.5) Gets the list of VALID subaps from SPARTA
        3.6) Verifies that exactly all VALID subaps are well illuminated

    * Setups back the reference position for all devices through assemblies

    * In NGS mode, checks that current PSF on acquisition camera
       (i.e. TDCS) is within limits compared to reference HOTSPOT

    * Adds informations (i.e. preliminary saved pupil position,
       piezo applied delta command, if in NGS mode current PSF
       coordinates on TDCS) to the last generated FITS header

    * Sets SAFE mode, leave a clean state, and exit
```

EXAMPLES

```
In trunk folder ERIS/MS/ermait/src/TECH_TEMPLATES_OBDS an example is:
ermait_tec_QuickHealthChkLGS.obd
ermait_tec_QuickHealthChkNGS.obd
```

6.9.45 ERIS_ao_tec_SafeWfs.tsf(1)

NAME

```
ERIS_ao_tec_SafeWfs.tsfx - Puts the AO board in a safe state.
```

DESCRIPTION

```
This template puts the AO board in a safe state by performing the following steps:
* Sets back the camera gain to 1
* Stops tracking for all AO tracking devices
* Closes the filter wheels and shutters
* Sets the TDCS in simulation mode, sends it ONLINE, and finally powers it off
```

EXAMPLES

```
In trunk folder ERIS/MS/ermait/src/TECH_TEMPLATES_OBDS an example is:
ermait_tec_SafeWfs.obd
```

6.9.46 ERIS_ao_tec_TurnCameraOff.tsf(1)

TO BE WRITTEN

6.9.47 ERIS_ao_tec_TurnCameraOn.tsf(1)

TO BE WRITTEN

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6.10 ERIS Technical Templates - Calibration Unit

6.10.1 ERIS_cu_tec_FunctionalTest.tsf(1)

NAME

```
ERIS_cu_tec_FunctionalTest.tsfx - Setups all CU devices and lamps
                                  and verifies their correct functionality.
```

DESCRIPTION

```
This template setups all CU devices and lamps and verifies
their correct functionality.
```

6.11 ERIS Technical Templates - Generic

6.11.1 ERIS_gen_tec_Mode.tsf(1)

NAME

```
ERIS_gen_tec_Mode.tsfx - Set Instrument Mode
```

6.11.2 ERIS_tec_FixSetup4NIX.tsf(1)

NAME

```
ERIS_tec_FixSetup4NIX.tsfx - sets up all NIX functions
```

SYNOPSIS

```
Template for performing all NIX mechanism positions setup
```

DESCRIPTION

```
setup all NIX mechanism to fixed positions. it is always placed before a real
NIX template run. This is to make sure that during TAT test, every NIX template
starts with the same mechanism positions regardless where and when it runs
```

6.11.3 ERIS_test_difftrack.tsf(1)

NAME

```
ERIS_test_difftrack.tsfx - Difftrack test template
```

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