

EUROPEAN SOUTHERN OBSERVATORY

Organisation Européenne pour des Recherches Astronomiques dans l'Hémisphère Austral
Europäische Organisation für astronomische Forschung in der südlichen Hemisphäre

ESO - European Southern Observatory
Karl-Schwarzschild Str. 2, D-85748 Garching bei München

Very Large Telescope
Paranal Science Operations
UVES Calibration Plan

Doc. No. VLT-PLA-ESO-13200-1123

Issue 117, Date 26/03/2026

Prepared L. Sbordone, C. Ledoux . . . . . .
Date Signature

Approved T. Klein . . . . . .
Date Signature

Released S. Mieske . . . . . .
Date Signature

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Change Record

Issue/Rev.	Date	Section/Parag. affected	Reason/Initiation/Documents/Remarks
0.7	11/05/99	All	Draft (calplan.doc)
0.8	30/11/99	All	cntd. (calplan.1)
0.9	01/12/99	All	maintenance plan added (calplan_1999-12-01)
1.0	19/02/00	All	updated for P65 (calplan_2000-02-19)
1.1	03/06/00	All	latex document created
			updated (orderdef,formatchecks)
			added (data volume estimate)
1.2	02/07/01		updated for P68:
		5.2	lowered flatfield frequency
		5	health checks added
		5.10	science calib summary table added
		6.11	parasitic light test added
		7	data volume: measured statistics
		A	calob configuration files added
1.3	05/07/02		updated for P70:
		5.9	I2 calibrations daytime
		6.12	efficiency monitoring added
1.4	19/02/03		updated for P72:
		5.6	updated for flux calibration
75	14/02/05	none	version number changed to 75 to match the new standard
76	02/05/05		Minor corrections
77	12/12/05		updated for P77
78	14/01/06		updated for P78
79	09/06/06		updated for P79
80	10/02/07		updated for P80
81	24/05/07		Minor corrections
		6.13	stabilised lamp monitoring added
82	03/12/07		Updated for P82
83	28/08/08		Updated for P83
84	26/02/09		Updated for P84
85	27/08/09		Minor typo corrections only for P85
86	27/02/10		Updated for P86
87	12/08/10		Updated for P87
88	18/02/11		Updated for P88
88.1	07/04/11		Author list updated
88.2	09/05/11	5.6, 6.12	Slit width used for spectrophotometric standard star observations updated. Updated list of OBs used for spectrophotometric standard star observations
88.2	09/05/11		Author list updated
89	01/09/11		Updated for P89
90	23/02/12		Updated for P90

Issue/Rev.	Date	Section/Parag. affected	Reason/Initiation/Documents/Remarks
91	29/08/12		Updated for P91
92	26/02/13		Updated for P92
93	28/08/13		Updated for P93
94	26/02/14		Updated for P94
95	23/07/14		Updated for P95
96	18/01/15		Updated for P96
97	05/09/15		Updated for P97
98	05/01/16		Updated for P98
99	09/09/16		Updated for P99
100	05/22/17		Updated for P99
		all	author list updated
		6.14	added description of twilight sky flat
		3, app. A	corrected wrong reference [2] –> [3]
101	08/29/17		Updated for P101
102	01/29/17		Version updated for P102
		all	Adapted for P2PP $\rightarrow$ P2 transition
103	09/19/17		Version updated for P103
104	05/23/19		Version updated for P104
		5.3.1	New procedure for wavelength calibrations of wide-slit science frames
106	05/23/20	all	Updated for P106
		5.6	Corrected outdated fluxcal frequency
107	11/23/20	all	Updated for P106
		6.13	Former Sect. 6.13, pag. 22, on “Stabilised lamp monitoring ” removed as obsolete.
108	05/24/2021	all	Updated for P108
109	08/25/2021	all	Updated for P109
110	01/18/2022	all	Updated for P110
		3	Minor correction
111	24/11/2022	all	Updated for P111
111.1	10/01/2023	5.6	New BFS / MFS flux standard schema
111.1	10/01/2023	6.12	Corrected cadence of effmon
112	09/05/2023	all	updated for P112
112	26/07/2023	all	updated for P113
117	26/03/2026	all	version updated to P117, no updates to content

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Contents

1 Glossary **1**

2 List of acronyms and abbreviations **3**

3 Introduction **4**

4 References **4**

5 SCIENTIFIC DATA CALIBRATION **5**

5.1 Detector Calibration . . . 5
5.1.1 Full characterization of scientific CCD detectors . . . 5
5.1.2 Instrument health check: daily Bias . . . 6
5.2 Flatfield Calibration . . . 6
5.2.1 Standard Calibrations . . . 6
5.2.2 Attached Calibrations . . . 7
5.3 Wavelength Calibration . . . 8
5.3.1 Standard Calibrations . . . 8
5.3.2 Attached Calibrations . . . 9
5.3.3 Instrument health check: resolving power . . . 9
5.4 Pipeline Calibration . . . 10
5.4.1 Orderdefinitions . . . 10
5.4.2 Formatchecks . . . 10
5.5 Instrument health check: Spectral Stability (grating positions) . . . 11
5.6 Flux Calibration . . . 12
5.7 Radial-Velocity Standards . . . 12
5.8 Telluric Standards . . . 13
5.9 Iodine Cell Calibrations . . . 13
5.10 Summary: Science Data Calibrations . . . 15

6 INSTRUMENT MONITORING **16**

6.1 CCD Cryogenics . . . 16
6.2 Camera Focus . . . 16
6.3 Lamp Intensities . . . 17
6.4 Resolution Check . . . 18
6.5 Motor Currents . . . 18
6.6 Slit Alignment . . . 19
6.7 Slit Linearity . . . 19
6.8 Derotator Alignment . . . 20
6.9 Image Slicer Alignment . . . 20
6.10 Crossdisperser Alignment . . . 21

6.11 Parasitic Light 21
6.12 Efficiency Monitoring 22
6.13 Twilight sky flat (solar spectrum) 22

7 Average Data Volume **24**
7.1 General 24
7.2 Service Mode: average numbers per day 24

1 Glossary

Acquisition: Accurate positioning of the telescope in order to center the target on the spectrograph slit.

Atmospheric Dispersion Correction (ADC) unit: This unit can be inserted in the pre-slit area of UVES to correct for atmospheric dispersion.

BIAS frame: Read-out of the CCD detector of zero integration time with shutter closed. The registered number of electrons per pixel has to be subtracted from a science exposure, because these were not created by photons from the source.

Calibration: Procedures to remove the instrumental signature from the scientific data (e.g., by subtracting BIAS frames and by dividing through the flatfield).

Camera: UVES has two cameras (red and blue arm) containing a CCD detector. The camera images the spectrum on the CCD.

Charge-Coupled Device: Electronic 2D-array detector converting photons into electrons. For UVES there are three CCDs, one for the blue arm and a mosaic of two CCDs for the red arm.

Cross-disperser grating: An echelle spectrograph contains two dispersive elements, in the case of UVES two gratings. One is the echelle grating, the other one is called the cross-disperser grating. UVES hosts two cross-dispersers, each with two different gratings. The cross-disperser grating determines the distance between the echelle orders.

Decker: Determines the slit length (not to be confused with the guy who built UVES).

Derotator: This element (not to be confused with the telescope adaptor/rotator unit) is placed in the diverging beam coming from the telescope and compensates for field rotation (which is inherent to the Nasmyth focus).

Dichroic: This element in the UVES mode selector reflects all the light below a certain wavelength and is transparent for longer wavelengths. This allows the operation of the spectrograph using both spectrograph arms simultaneously.

Flatfield: Spectrum obtained from light source with a flat (i.e. without spectral features) energy distribution, e.g., a tungsten lamp. The registered signal provides information about the response of the detector, allowing a determination of the variation in sensitivity from pixel to pixel, the echelle order shape, the presence of bad columns on the detector, etc.

Free Setting: A setting of the instrument defined by the observer, generally with a different wavelength, readout or binning than any of the standard settings. Free settings are normally only available in visitor mode in order to reduce the calibration load in service mode.

Grating: UVES contains two echelle gratings (one blue and one red) which form the heart of the spectrograph. The grating disperses the light in its colors.

Guide star: A point source used for accurate tracking (and active control of the telescope mirrors).

Image slicer: This device converts a two-dimensional image (e.g., of a star) in the focal plane of the telescope into a one-dimensional slit. In this way, the light that normally would fall outside the slit (especially when using a narrow slit for high spectral resolution) is fed to the spectrograph.

Iodine cell: A glass cell filled with heated I_2 gas can be inserted in the light beam to superimpose a molecular absorption spectrum, containing many lines, on the observed astronomical spectrum. This enables very accurate wavelength calibration.

Mode Selector: Unit in the pre-slit area of UVES which directs the light to one of the two spectrograph arms or to both arms simultaneously (with help of dichroics).

Observation Block: A logical unit of exposures needed to obtain a coherent set of data. Encompasses all relevant information for a successful data acquisition on a target. It consists of target information, a set of templates, parameter files for the templates, conditions, requirements and comments concerning the specified observations. It represents the entity the short-term scheduler deals with. Constructing Observation Blocks is part of the Phase II Proposal Preparation Process.

Phase II: During this phase the successful applicant (whose Phase I proposal has been accepted based on the scientific rationale and technical feasibility) prepares the Observation Blocks to carry out the observing program.

Pre-slit area: UVES spectral elements located in front of the spectrograph slits.

Spectrograph arm: UVES consists of two "separate" spectrographs, one optimized for the blue (blue arm) and one for the red wavelength region (red arm).

Spectrograph slit: The image of the astronomical source produced by the telescope is focused on the spectrograph slit.

Standard Setting: A pre-defined setting of the instrument facilitating the preparation of the observations. The Observatory provides the relevant calibration files when a Standard Setting is used.

Template: A set of instructions for the performance of a standard operation on an instrument, the instrument and detector setups. The templates represent specially devised sequences for often used instrument operations and calibrations.

Template Signature File: This is a description of a Template and its parameters. It contains information about the type and allowed ranges of the parameters; some of the parameters have to be set by the observer.

Wavelength calibration: Spectrum obtained from emission-line source. The wavelengths of the (many) emission lines are accurately known and are used to transform pixel space into wavelength space.

2 List of acronyms and abbreviations

AT	Acquisition Template
CT	Calibration Template
CCD	Charge-Coupled Device
ESO	European Southern Observatory
OB	Observation Block
OS	Observation Software
OT	Observation Template
UVES	Ultraviolet and Visual Echelle Spectrograph
VLT	Very Large telescope

3 Introduction

This document describes the calibration procedures for the UVES instrument at the VLT (cf. [1]).
For each calibration task the document defines the:

- **Responsible** group to carry out the calibrations,
- **Phase**, i.e., when the calibrations have to be carried out (day or nighttime),
- **Frequency**, i.e., how often the calibration task has to be carried out. This is governed by the stability of the instrument,
- **Procedure** how the calibration task is carried out,
- **Outputs**, i.e., the data products of the calibration task,
- **Prepared OBs**, i.e., the pre-prepared OBs to carry out the task (and the corresponding **OT queues**),
- **Duration**, i.e., an estimate of the required time to execute the calibration task,
- **Prerequisites**, i.e., possible dependencies on instrumental conditions or other calibration tasks are given.

In the last section of the document an estimate of the expected data volume of UVES calibrations and observations is given. The technical details of the automatic execution of the daily calibration plan are implemented on Paranal in the configuration files of the automatic calibration OB tool (cmm modules `calob`, `uvocal`) (cf. [3]). Therefore the main configuration files are shown in the appendix of this document.

4 References

[1] *UVES User Manual*, VLT-MAN-ESO-13200-1825, Issue 100, 05/22/17, L. Sbordone, C. Ledoux

[2] *UVES Templates Reference Guide*, VLT-MAN-ESO-13200-1567, Issue 100, 05/22/17, L. Sbordone, C. Ledoux

[3] *Calibration OB Tool User Manual*, VLT-MAN-ESO-17240-2264, Version 6, 04/30/08, R. Schmutzer

5 SCIENTIFIC DATA CALIBRATION

This section of the UVES calibration plan describes what UVES calibration data has to be collected with which frequency to allow to

REMOVE INSTRUMENTAL SIGNATURES

from the scientific data with a guaranteed accuracy.

5.1 Detector Calibration

5.1.1 Full characterization of scientific CCD detectors

- Responsible: Science Operations/Engineering(→Detector Specialist)
- Phase: Daytime
- Frequency: 1 / 30 (full characterization)
  1 / 7 (Bias frames)
- Procedure: Take a series of red and blue CCD lamp flats, 1h darks (2x2 binning only to achieve a measurable signal), and biases for the standard CCD modes

  ```
  225kHz,1x1,low
  225kHz,1x2,low
   50kHz,2x2,high
   50kHz,2x3,high
  ```

  Data reduction by the pipeline: `recipe uves_ccdtest` offline Gasgano script: `uves_ccdtest.sh`
- Outputs: Standard CCD characteristics:
  - Bias level
  - Gain
  - RON
  - Dark current
  - Bad pixel/columns map
  - Linearity
  - Shutter error
  - Relative Contamination

  Output are fed back (automatically) to the Paranal fitslog data base ("autrep") via the QC1LogWriter tool for trend analysis; RON and GAIN/CONAD must be updated in the instrument data base of significant variations $> 5\%$ are recognized. This is crucial to provide correct input for the data reduction pipeline
- Prepared OBs:

  ```
  impex/UVES/Technical_CCD_test/blue_ccdtest.obx
  impex/UVES/Technical_CCD_test/red_ccdtest.obx
  impex/UVES/Technical/bias_daily.obx
  ```

- OT queue: `UVES.Maintenance`
- Duration: 3 hrs + 1hr per dark (without pipeline data processing)
- Prerequisites: pipeline available
- See also:

5.1.2 Instrument health check: daily Bias

- Responsible: Science Operations
- Phase: Daytime
- Frequency: Daily
- Procedure: Take 5 bias frames for the standard CCD modes `225kHz,1x1,low 50kHz,2x2,high`
  Data reduction by the pipeline: `recipe uves_mkmaster`
- Outputs: Bias characteristics:
  - Bias level
  - RON

  Output are fed back (automatically) to the Paranal fitslog data base ("autrep") via the QC1LogWriter tool for trend analysis;
  → check for the proper CCD status.
- Prepared OBs: OB `Bias_daily.obd` automatically included by `calob` tool.
- Duration: 10 min
- Prerequisites: pipeline available
- See also:

5.2 Flatfield Calibration

5.2.1 Standard Calibrations

- Responsible: Science Operations
- Phase: Daytime
- Frequency: Daily; in Service Mode 1 / 3 days per used setting in science data (to lower calibration load).
- Procedure: 5 Halogen lamp spectra per standard wavelength setting (SM) or specific wavelength setting (VM) and per slit width are taken. For extreme blue setting (central wavelength $< 360\,\mathrm{nm}$) 5 Deuterium lamp spectra are added.
- Outputs: High SNR master flatfield exposures (exposure level 5x30000 ADU)

- Prepared OBs:

  `impex/UVES/Calibration_225kHz_1x1_low/<mode>_225kHz_1x1_low_cal.obx`
  `impex/UVES/Calibration_50kHz_2x2_high/<mode>_50kHz_2x2_high_cal.obx`
  `impex/UVES/Calibration_50kHz_2x3_high/<mode>_50kHz_2x3_high_cal.obx`
  `impex/UVES/Calibration_225kHz_1x2_low/<mode>_225kHz_1x2_low_cal.obx`

  with `mode = blue red dic1 dic2`

- OT queue: `UVES.Daytime.Calibration`

- Duration: Calibration per standard settings requires typically 15 minutes for a slit width of 0.8 arcsec (including Flats, ThArs, and Biases) for a 1x1 binning, low gain CCD readout mode.

- Prerequisites:

  The restriction to daytime master flatfields is sufficient for most purposes; the accuracy of fringe correction has to been monitored and a refreshing of the flats with a period of 3 days is regarded as sufficient.

  If the daily formatcheck tests indicate a shift of the gratings or an adjustment of the gratings has been performed, new flats have to be taken immediately afterwards.

- See also: 5.3.2, 5.2

5.2.2 Attached Calibrations

- Responsible: Science Operations: Instrument Operator

- Phase: Nighttime

- Frequency:
  SM: If high-precision flatfielding in the fringing range of the CCDs (> 650 nm) is required; OB has to be accordingly prepared

  VM: On request

- Procedure: Halogen lamp spectra can be attached as template to the OB which allows to take a flatfield calibration exposure in exactly the same instrument setting as the science exposure

- Outputs: High SNR master flatfields (exposure level 30000ADU)

- Templates:

  `UVES_red_cal_flatatt.tsf`
  `UVES_blue_cal_flatatt.tsf`
  `UVES_dic1_cal_flatatt.tsf`
  `UVES_dic2_cal_flatatt.tsf`

- Duration: 1 minute instrument configuration + 15 sec exposure + 40sec readout = 2 minutes

- Prerequisites: Corresponding daytime calibrations follow according to the rules in 5.2.1

- See also: 5.2.1, 5.3

5.3 Wavelength Calibration

5.3.1 Standard Calibrations

- Responsible: Science Operations
- Phase: Daytime
- Frequency: Daily
- Procedure: Thorium-Argon calibration lamp spectra per standard wavelength setting (SM) or specific wavelength setting (VM) and per slit width. Since May 2019 wavelength calibration frames are taken with the same slit width as the science *for slit widths below 2.1"*. Above that value, a 1" slit is used instead.

  Dispersion solutions have to be measured daily to account for temperature variations, i.e., the change of the refractive index of the air with temperature (and pressure).

  From trend analysis (formatcheck) the temperature introduced velocity variations are for the red and blue arm:

  $$\Delta v = 450\,\mathrm{m/s\ K^{-1}}$$

  Since we guarantee a wavelength calibration accuracy of 500 m/s and the typical maximum temperature gradients per day are 1 K, daily calibrations are required.
- Outputs: 2D (pixel-order) dispersion solutions. Resolving power and FWHM as a function of chip position/wavelength (Min/Max/Median R and FWHM are fed back to the Paranal fitslog data base ("autrep") via the QC1LogWriter tool for trend analysis)
- Prepared OBs:

  `impex/UVES/Calibration_225kHz_1x1_low/<mode>_225kHz_1x1_low_cal.obx`
  `impex/UVES/Calibration_50kHz_2x2_high/<mode>_50kHz_2x2_high_cal.obx`
  `impex/UVES/Calibration_50kHz_2x3_high/<mode>_50kHz_2x3_high_cal.obx`
  `impex/UVES/Calibration_225kHz_1x2_low/<mode>_225kHz_1x2_low_cal.obx`

  with `mode = blue red dic1 dic2`
- OT queue: `UVES.Daytime.Calibration`
- Duration: Calibration per standard settings requires typically 15 minutes for a slit width of 0.8 arcsec (including Flats, ThArs, and Biases) for a 1x1 binning, low gain CCD readout mode .
- Prerequisites: see 5.2.1
- See also: 5.2

5.3.2 Attached Calibrations

- Responsible: Science Operations: Instrument Operator
- Phase: Nighttime
- Frequency:
  SM: If high-precision radial-velocities ($< 500\,\mathrm{m/s}$) are aimed for; OB has to be accordingly prepared

  VM: On request
- Procedure: Thorium-Argon calibration lamp spectrum can be attached as template to the OB which allows to take a wavelength calibration exposure in exactly the same instrument setting as the science exposure
- Outputs: 2D (pixel-order) dispersion solutions Resolving power as a function of chip position/wavelength
- Templates:

  `UVES_red_cal_waveatt.tsf`
  `UVES_blue_cal_waveatt.tsf`
  `UVES_dic1_cal_waveatt.tsf`
  `UVES_dic2_cal_waveatt.tsf`
- Duration: 1 minute instrument configuration + 15 sec exposure + 40sec readout = 2 minutes
- Prerequisites:
- See also: 5.2, 5.3.1

5.3.3 Instrument health check: resolving power

- Responsible: Science Operations
- Phase: Daytime
- Frequency: Daily; in Service Mode 1 / 3 days per used setting in science data (to lower calibration load).
- Procedure: Thorium-Argon calibration lamp spectra in the Blue 437 standard setting (slit 0.4 arcsec) and one exposure in the Red 580 standard setting (slit 0.3 arcsec)
- Outputs: Min/Max/Median R and FWHM fed to the Paranal fitslog data base ("autrep") via the QC1LogWriter tool for trend analysis

  → check for the proper instrument focusing.
- Prepared OBs: OB `Resolution_check.obd` automatically included by `calob` tool.

  `impex/UVES/Technical/red_rescheck.odx`
  `impex/UVES/Technical/blue_rescheck.odx`

- OT queue: `UVES.Maintenance`
- Duration: 5 minutes
- Prerequisites:
- See also: 5.3.1

5.4 Pipeline Calibration

5.4.1 Orderdefinitions

- Responsible: Science Operations
- Phase: Daytime
- Frequency:
  SM: 1 / 3 days per used setting in science data (to lower calibration load).
  VM: Once per setup and run
- Procedure: Flatfield exposure with short decker to trace orders.
- Outputs: Order definition table, background table
- Prepared OBs:

  `impex/UVES/Technical_225kHz_1x1_low/<mode>_225kHz_1x1_low_tec.obx`
  `impex/UVES/Technical_50kHz_2x2_high/<mode>_50kHz_2x2_high_tec.obx`
  `impex/UVES/Technical_50kHz_2x3_high/<mode>_50kHz_2x3_high_tec.obx`
  `impex/UVES/Technical_225kHz_1x2_low/<mode>_225kHz_1x2_low_tec.obx`

  with `mode = blue red dic1 dic2`
- OT queue: `UVES.Daytime.Calibration`
- Duration: 1 minute instrument configuration + 15-60 sec exposure + 40sec readout = 2.5 minutes
- Prerequisites:
- See also:

5.4.2 Formatchecks

- Responsible: Science Operations
- Phase: Daytime
- Frequency:
  SM: 1 / 3 days per used setting in science data (to lower calibration load).
  VM: Once per setup and run

- Procedure: Thorium-Argon exposures with squared 0.7 arcsec slit for fitting of line positions predicted by physical model.
- Outputs: Guess session tables for wavelength calibration (and order definition)
- Prepared OBs:

  `impex/UVES/Technical_225kHz_1x1_low/<mode>_225kHz_1x1_low_tec.obx`
  `impex/UVES/Technical_50kHz_2x2_high/<mode>_50kHz_2x2_high_tec.obx`
  `impex/UVES/Technical_50kHz_2x3_high/<mode>_50kHz_2x3_high_tec.obx`
  `impex/UVES/Technical_225kHz_1x2_low/<mode>_225kHz_1x2_low_tec.obx`

  with `mode = blue red dic1 dic2`
- OT queue: `UVES.Daytime.Calibration`
- Duration: 1 minute instrument configuration + 15 sec exposure + 40sec readout = 2 minutes
- Prerequisites:
- See also:

5.5 Instrument health check: Spectral Stability (grating positions)

- Responsible: Science Operations/Engineering (daytime)
- Phase: Daytime
- Frequency: Daily; whenever a check of the spectral format is needed (e.g., after an earthquake)
- Procedure: narrow Thorium-Argon calibration lamp spectra for Red 580,860 and Blue 346,437 standard settings.
- Outputs: spectral shifts in dispersion and X-dispersion direction. results are fed back (automatically) to the Paranal fitslog data base ("autrep") via the QC1LogWriter tool for trend analysis
- Prepared OBs: OB `Stability_short.obd` automatically included by `calob` tool.

  `impex/UVES/Technical/stability.odx`
  `impex/UVES/Technical/stability_short.odx`
- OT queue: `UVES.Maintenance`
- Duration: 5 minutes for 2 exposures in red and blue arm
- Prerequisites:
- See also:

5.6 Flux Calibration

- Responsible: Science Operations: Instrument Operator
- Phase: Nighttime / twilight
- Frequency:
  VM: Minimum once per run for used wavelength settings SM: ∼14 days for DIC1 346+580, 390+564, and DIC2 437+860. ∼30 days for DIC2 390+760 and RED 520, 600. DIC1 346+580, DIC1 390+564, DIC2 437+860, DIC2 390+760, Red 520, and Red 600 for the CCD mode 225kHz,1x1,low
- Procedure: Observe spectrophotometric standard stars with wide open slit (5-10 arcsec)

  Note: Observations with same slit as science exposure are possible but are up to the visitor (VM) or have to be provided as OBs in SM. Otherwise, estimates of slit losses, e.g., with the ETC should be sufficient

  Response curves are derived by the pipeline automatically.
- Outputs: Response function (no slit losses).

  Telescope+Instrument efficiency as a function of wavelength Efficiencies at order centers are logged to the Paranal fitslog data base ("autrep") via the QC1LogWriter tool for trend analysis.

  If trends are discovered (e.g., aging of coatings), corrections have to be given to the ETC.
- Prepared OBs:

  `impex/UVES/SpecPhotStd/specphot-std-dic1_<target>.obx`
  `impex/UVES/SpecPhotStd/specphot-std-dic2_<target>.obx`
- OT queue: `UVES Daily Monitoring`
- Duration: 2min preset/acquisition + 3x1min configuration + 2x10+1x5min exposure + 3x40sec readout
- Prerequisites: Spectrophotometric extinction tables for Paranal (at the moment La Silla tables are used). Flux tables for `target` (currently the Midas fluxtable is used).
- See also:

5.7 Radial-Velocity Standards

- Responsible: Science Operations: Instrument Operator
- Phase: Nighttime
- Frequency:
  VM: on request

  SM: on request if OBs are provided

- Procedure: Observe radial velocity-standard stars
- Outputs: Radial-velocity reference spectrum
- Prepared TPs:

  `impex/UVES/RadVelStandard/`

  (Elodie RV standards, RMS $< 50\,\mathrm{m/s}$)
- Duration: 5min preset/acquisition + 1min configuration + `exposuretime` + 40sec readout
- Prerequisites:
- See also:

5.8 Telluric Standards

- Responsible: Science Operations: Instrument Operator
- Phase: Nighttime
- Frequency:
  VM: on request

  SM: on request if OBs are provided
- Procedure: Observe fast rotating and featureless hot star with the same slit width and at similar airmass as and close in time with the science spectrum to record the telluric spectrum
- Outputs: Telluric reference spectrum
- Prepared OBs: none, but target definitions from fast rotating and hot spectrophotometric standard star should be used
- Duration: 2min preset/acquisition + 1min configuration + `exposuretime` + 40sec readout
- Prerequisites:
- See also:

5.9 Iodine Cell Calibrations

- Responsible: Science Operations/Engineering
- Phase: Daytime
- Frequency: If iodine cell observations are scheduled for the night
- Procedure: The following calibration exposures are needed in the wavelength setting R600:

  - 1 Thorium-Argon (w/o I2 cell) for dispersion relation
  - 5 Flats (w/o I2 cell) for flatfielding/blaze correction
  - 5 Flats (with I2 cell) for IP reconstruction

- Outputs: dispersion relation, flatfielding/blaze correction, input for IP reconstruction
- Prepared OBs:

  `impex/UVES/Calibration_225kHz_1x1_low/iodine_cal.obx`

- OT queue: `UVES.Daytime.Calibration`
- Duration: 30min
- Prerequisites: Iodine Cell heating started 2 hours before start of observations (heating ins controlled MANUALLY from INS Status panel)

  FTS spectrum of the I2 cell has to be available (is on the web: UVES operation homepage).

- See also:

5.10 Summary: Science Data Calibrations

To be distributed in the UVES User Manual:

UVES Science Data Calibration Plan
(per instrument and detector setting)

Calibration	number	frequency [1/days]	purpose
Flatfields	5	1 / 3	creation of master flats
attached Flatfields	n	o.r.	high-precision flatfielding
Wavelength	1	1 / 1	dispersion solution, resolving power
attached Wavelength	n	o.r.	high-precision wavelength calibration
Order Definition	1	1 / 3	pipeline calibration: order definition
Format Check	1	1 / 3	pipeline calibration: physical model
Bias	5	1 / 7	creation of master biases
Dark	3	1 / 30	creation of master darks
Flux Standard	1	1 / 3	response correction, flux calibration
Telluric Standard	n	o.r.	removal of telluric spectrum
Radial Velocity Std.	n	o.r.	absolute radial velocity calibration
Iodine Cell Flatfields[1]	5	1 / 1	master flats for IP reconstruction

[1] if iodine cell was used
o.r. = on request only, corresponding OBs to be provided by user
n = number to be defined by user

6 INSTRUMENT MONITORING

This section of the UVES calibration plan describes what UVES system data has to be collected with which frequency to allow trend analysis of the instrument healthiness and to initiate preventive maintenance activities

6.1 CCD Cryogenics

- Responsible: Engineering
- Phase: Day/Nighttime
- Frequency: continuously
- Procedure: The CCD cryogenic data are continuously monitored by sensors
- Outputs: The following CCD cryogenics data have to be monitored for both CCD systems:
  - CCD chip temperature
  - Cold plate temperature
  - Exhaust valve temperature
  - Vacuum level
  - LN2 tank levels (tanks to be replaced before 10% level)

  All sensor data are fed automatically to the Paranal fitslog data base ("autrep") via the QC1LogWriter tool for trend analysis
- Prepared OBs: n/a
- Duration: n/a
- Prerequisites:
- See also:

6.2 Camera Focus

- Responsible: Engineering
- Phase: Daytime
- Frequency: 1 / month

  or

  with temperature changes $> 10\,\mathrm{K}$ inside the enclosure
- Procedure: Take narrow slit Thorium-Argon exposures with a sequence of behind slit filters of 0,5,10,15 thickness

- Outputs: Pipeline provides resolution plots for the different filters. Median resolution has to be maximum for 5mm filter. (Min/Max/Median resolution as a function of filter thickness are fed back (automatically) to the Paranal fitslog data base ("autrep") via the QC1LogWriter tool for trend analysis)
- Prepared OBs:

  `impex/UVES/Technical/red_focus.obx`
  `impex/UVES/Technical/blue_focus.obx`

- OT queue: `UVES.Maintenance`
- Duration: 15min for red and blue including setup times
- Prerequisites: pipeline running
- See also:

6.3 Lamp Intensities

- Responsible: Engineering
- Phase: Daytime
- Frequency: 1 / month
- Procedure: Record lamp intensities with exposure meters over 60 seconds
- Outputs: Sample file, Min/Max/Average intensity of D2L,FF1,FF2,FF3,FF4,TAL lamps (Sample file is archived; Min/Max/Average intensities for each lamp is fed back to the Paranal fitslog data base ("autrep") for trend analysis; data sets are taken with the sampling tool and must be archived)
- Prepared OBs:

  `impex/UVES/Maintenance/LampLevTest.obx`

- OT queue: `UVES.Maintenance`
- Duration: 15 minutes
- Prerequisites:
- See also:

6.4 Resolution Check

- Responsible: Engineering
- Phase: Daytime
- Frequency: 1 / month
- Procedure: Take ThAr exposures with slit widhts 0.3(0.4) - 0.6 - 0.8 - 1.0 -1.2 arcsec. Resolving power for each ThAr is measured by the pipeline or use Gasgano script `uves_resol.sh`.
- Outputs: Resolution plot, median, average, sigma resolving power. Median/Average/Sigma resolving power for each setting is fed back to the Paranal fitslog data base ("autrep") via the QC1LogWriter tool for trend analysis.
- Prepared OBs:

  `impex/UVES/Technical/blue_rescheck.obx`
  `impex/UVES/Technical/red_rescheck.obx`

- OT queue: `UVES.Maintenance`
- Duration: 15 minutes
- Prerequisites: pipeline running
- See also:

6.5 Motor Currents

- Responsible: Engineering
- Phase: Daytime
- Frequency: 1 / month
- Procedure: Record motor currents over the full encoder range
- Outputs: Sample file, Min/Max/Average currents of all motorized functions (Sample file is archived; Min/Max/Average currents for all motors are be fed back to the Paranal fitslog data base ("autrep") for trend analysis; data sets are taken with the sampling tool are archived)
- Prepared OBs:

  `impex/UVES/Maintenance/MotorCurTest.obx`

- OT queue: `UVES.Maintenance`
- Duration: 45 minutes
- Prerequisites:
- See also:

6.6 Slit Alignment

- Responsible: Engineering
- Phase: Daytime
- Frequency: 1 / month
- Procedure: Measure position of pinhole image on the blue and red slitviewers for derotator position angle 0.0
- Outputs: x,y position of pinhole image for red and blue slit (Positions are recorded to the Paranal fitslog data base ("autrep") for trend analysis)
- Prepared OBs:

  `impex/UVES/Maintenance/AlignTest.obx`

- OT queue: `UVES.Maintenance`
- Duration: 5min
- Prerequisites:
- See also:

6.7 Slit Linearity

- Responsible: Engineering
- Phase: Daytime
- Frequency: 1 / month
- Procedure: Test linearity of slit jaw movements
  Use flatfield lamp, open slit and measure countrate on exposure meter. Close slit in small steps and measure deviation from linear curve (assuming that the countrate is zero for a slit of width 0)
- Outputs: Sample curve, Min/Max deviation from linearity (Sample file is archived; deviations are recorded to the Paranal fitslog data base ("autrep") for trend analysis)
- Prepared OBs:

  `impex/UVES/Maintenance/SlitLinTest.obx`

- OT queue: `UVES.Maintenance`
- Duration: 10min
- Prerequisites:
- See also:

6.8 Derotator Alignment

- Responsible: Engineering
- Phase: Daytime
- Frequency: 1 / month
- Procedure: Measure position of pinhole image on the red slitviewer for derotator position angle 0,60,120,180,240,300
- Outputs: x,y position of pinhole image as a function of derotator angle → center position and deviations as a function of derot. angle (Center Position and deviations are recorded to the Paranal fitslog data base ("autrep") for trend analysis)
- Prepared OBs:

  `impex/UVES/Maintenance/AlignTest.obx`

- OT queue: `UVES.Maintenance`
- Duration: 5min
- Prerequisites:
- See also:

6.9 Image Slicer Alignment

- Responsible: Engineering/Operation Astronomer
- Phase: Nighttime
- Frequency: 1 / month (during technical time)
- Procedure: Check alignment of IS with respect to slit.
  Acquire star on IS and measure countrate on exposure meter (nominal slit width). Then slowly open slit and measure countrates which determines the slit loss due to the IS misalignment
- Outputs: Sample curve; Min, max, average countrate (Sample curve is archived, countrates are recorded to the fitslog data base ("autrep") for analysis)
- Prepared OBs:

  `impex/UVES/Maintenance/ISAlignTestBlue.obx`
  `impex/UVES/Maintenance/ISAlignTestRed.obx`

- OT queue: `UVES.Maintenance`
- Duration:
- Prerequisites:
- See also:

6.10 Crossdisperser Alignment

- Responsible: Engineering
- Phase: Daytime
- Frequency: 1 / month
- Procedure: Measure x-position of zero order for crossdispersers 1-4
  Measure y-position of blaze maximum
  Take flats in zero order with 1 arcsec decker
- Outputs: data is analyzed by Midas script on instrument workstation: data file with trace of x,y,intensity of zero-order (archived) x positions of zero order, y position of blaze maximum for CD#1,2,3,4 (Positions are recorded to the Paranal fitslog data base ("autrep") for trend analysis)
- Prepared OBs:

  `impex/UVES/Maintenance/AlignTest.obx`
- OT queue: `UVES.Maintenance`
- Duration: 15min for 4 crossdispersers
- Prerequisites:
- See also:

6.11 Parasitic Light

- Responsible: Engineering
- Phase: Daytime
- Frequency: 1 / month
- Procedure: Take set of three 1 hours exposures with open CCD shutter in 2x2 binning CCD mode.
  Telescope enclosure must be dark, all lights off. Should be performed for each Cross Disperser.
- Outputs: Measure parasitic light levels (as for darks) in electrons/hour/pixel.
- Prepared OBs:

  `impex/UVES/Maintenance/ParasiticLight.obx`
- OT queue: `UVES.Maintenance`
- Duration: 3 hours per arm
- Prerequisites: pipeline running
- See also:

6.12 Efficiency Monitoring

- Responsible: Science Operations: Instrument Operator
- Phase: Nighttime
- Frequency: 30 days
- Procedure: Observe selected spectrophotometric standard stars with wide open slit (5-10 arcsec) under dark and photometric conditions.

  Efficiency curves are derived by the pipeline automatically.
- Outputs: Efficiency curves.

  Telescope+Instrument efficiency as a function of wavelength. Efficiencies at order centers are logged to the Paranal fitslog data base ("autrep") via the QC1LogWriter tool for trend analysis.

  If trends are discovered (e.g., aging of coatings), corrections have to be given to the ETC.
- Prepared OBs:

  `impex/UVES/SpecPhotStd/specphot-std-dic1_<target>.obx`
  `impex/UVES/SpecPhotStd/specphot-std-dic2_<target>.obx`
- OT queue: `UVES_Efficiency_Monitoring`
- Duration: 2min preset/acquisition + 1min configuration + 3-10min exposure + 40sec readout
- Prerequisites: Spectrophotometric extinction tables for Paranal (at the moment La Silla tables are used). Flux tables for `target` (currently the Midas fluxtable is used).
- See also:

6.13 Twilight sky flat (solar spectrum)

- Responsible: Science Operations: Instrument Operator
- Phase: Daytime/Nighttime
- Frequency: 1 / month
- Procedure: Observe the twilight sky at zenith to produce a high-S/N solar spectrum in DIC1 390+580 setting with 0.8" slit. Attached ThAr calibration.
- Outputs: Monitoring of the long term radial velocity stability of the instrument.
- Prepared OBs:

  `impex/UVES/SpecPhotStd/Solar-spectrum+ThAr.obx`
- OT queue: `UVES.Maintenance`

- Duration: $\sim$ 15min
- Prerequisites:
- See also:

7 Average Data Volume

In this section the data production rate by UVES is summarized. The figures for the average data volume in Service Mode are based on the statistics from the Garching pipeline operations in Period 67.

7.1 General

UVES	RED	BLUE	RED	BLUE
	binning 1x1		binning 2x2	
size:	35 Mb	15 Mb	9 Mb	4 Mb
standard calibration per setup: 5 Flats, 1 Wave, 1 Fmt, 1 Ord:				
size:	200 Mb	120 Mb	72 Mb	32 Mb
standard calibration per arm: 5 Bias				
size:	175 Mb	75 Mb	45 Mb	20 Mb

7.2 Service Mode: average numbers per day

daytime calibrations:

2 x 5 standard settings used (including different slit widths)

UVES	RED	BLUE	RED	BLUE
calibs:	840 Mb	240 Mb	210 Mb	60 Mb
bias:	175 Mb	75 Mb	45 Mb	20 Mb
total:	1015 Mb	315 Mb	255 Mb	80 Mb
SUM:	1330 Mb		335 Mb	

night time:

2 x 5 standard settings used (including different slit widths),
30 science, 10 standard star exposures

UVES	RED	BLUE	RED	BLUE
science:	350 Mb	75 Mb	90 Mb	20 Mb
standards:	105 Mb	30 Mb	27 Mb	12 Mb
total:	455 Mb	105 Mb	117 Mb	32 Mb
SUM	560 Mb		150 Mb	

→ **Average data volume (SM):** 2.4 Gb per day

Appendix A: uvocal configuration files

The daily calibration plan is coded with the help of the Calibration OB tool (`calob`). See [3] for details and the configuration syntax.

In the following, the main configuration file `uvocalCALOB.cfg` is listed which defines the calibrations to be performed for all **Modes** and **Paths** of the UVES instrument. It further contains all rules for the usage of lamps in combination with the different instrument configurations. Standard exposure times for given gratings, slit widths, CCD binning, and CCD gains are defined, too.

As example for calibration template (.obdx) files, the templates for all red calibration templates are listed (**Mode = RED** and **Path = RED**). The calibration templates define how the keywords of the calibration template signature (.tsf) files have to be filled from the FITS keywords of the science exposure and the tabulated information and rules provided by the `uvocalCALOB.cfg` file. All other **Mode** and **Path** combinations are defined in the corresponding calibration template files in an identical way.

The validity times of 3 days for flatfields, orderdefinitions, and formatchecks as defined earlier in this document are not reflected in the configuration files below although are obeyed by the calobBuild script.

Main configuration: uvocalCALOB.cfg

```
#*******************************************************************************
# E.S.O. - VLT project
#
# "@(#) $Id: uvocalCALOB.cfg,v 1.12 2001/06/30 20:23:55 vltsccm Exp $"
#
# who       when      what
# --------  --------  ----------------------------------------
# aka       30/06/01  Resolution check added
# aka       13/03/01  625kHz readout mode added
# aka       27/02/01  Support for iodine cell added
# aka       11/11/00  D2L time changed to 180sec
# aka       07/11/00  update for new CD#4
# aka       21/10/00  1x2 binning corrected, second flat option added
# aka/rsc   29/09/00  CALIB.TPL.ENDOBD entry added.
# aka/rsc   11/07/00  created.

# Observation Block description follows
OBS.ID                  "0";
OBS.NAME                "Calibration";
OBS.GRP                 "0";
OBS.PROG.ID             "60.A-9022(A)";
OBS.PI-COI.ID           "52022";
OBS.PI-COI.NAME         "Condor";

# Initial and end OBDs to be included
CALIB.TPL.OBD1          "Bias_daily.obd";
CALIB.TPL.OBD2          "Stability_short.obd";
CALIB.TPL.OBD3          "Resolution_check.obd";
CALIB.TPL.ENDOBD        "UVES_gen_tec_standby.obd";

# FITS keywords used to select the calibrations
CALIB.TPL.FITS          "INS.MODE INS.PATH";
CALIB.TPL.ORDER         "INS.PATH";

# Calibrations for Mode=BLUE, path=BLUE:
CALIB.TPL1.INDEX        "BLUE BLUE";
CALIB.TPL1.VALUE1       "UVES_blue_cal_flatfree.obdx";
CALIB.TPL1.VALUE2       "UVES_blue_cal_flatfree2.obdx";
CALIB.TPL1.VALUE3       "UVES_blue_cal_wavefree.obdx";
CALIB.TPL1.VALUE4       "UVES_blue_cal_bias.obdx";
CALIB.TPL1.VALUE5       "UVES_blue_tec_orderdef.obdx";
CALIB.TPL1.VALUE6       "UVES_blue_tec_fmtchk.obdx";

# Calibrations for Mode=RED, path=RED:
CALIB.TPL2.INDEX        "RED RED";
CALIB.TPL2.VALUE1       "UVES_red_cal_flatfree.obdx";
# if iodine cell was IN, take flats with iodine cell:
CALIB.TPL2.VALUE2       "UVES_red_i2_cal_flatfree.obdx";
CALIB.TPL2.VALUE3       "UVES_red_cal_wavefree.obdx";
```

```
CALIB.TPL2.VALUE4       "UVES_red_cal_bias.obdx";
CALIB.TPL2.VALUE5       "UVES_red_tec_orderdef.obdx";
CALIB.TPL2.VALUE6       "UVES_red_tec_fmtchk.obdx";

# Calibrations for Mode=DICHR#1, path=BLUE:
CALIB.TPL3.INDEX        "DICHR#1 BLUE";
CALIB.TPL3.VALUE1       "UVES_dic1b_cal_flatfree.obdx";
CALIB.TPL3.VALUE2       "UVES_dic1b_cal_flatfree2.obdx";
CALIB.TPL3.VALUE3       "UVES_dic1b_cal_wavefree.obdx";
CALIB.TPL3.VALUE4       "UVES_blue_cal_bias.obdx";
CALIB.TPL3.VALUE5       "UVES_dic1b_tec_orderdef.obdx";
CALIB.TPL3.VALUE6       "UVES_dic1b_tec_fmtchk.obdx";

# Calibrations for Mode=DICHR#2, path=BLUE:
CALIB.TPL4.INDEX        "DICHR#2 BLUE";
CALIB.TPL4.VALUE1       "UVES_dic2b_cal_flatfree.obdx";
CALIB.TPL4.VALUE2       "UVES_dic2b_cal_flatfree2.obdx";
CALIB.TPL4.VALUE3       "UVES_dic2b_cal_wavefree.obdx";
CALIB.TPL4.VALUE4       "UVES_blue_cal_bias.obdx";
CALIB.TPL4.VALUE5       "UVES_dic2b_tec_orderdef.obdx";
CALIB.TPL4.VALUE6       "UVES_dic2b_tec_fmtchk.obdx";

# Calibrations for Mode=DICHR#1, path=RED:
CALIB.TPL5.INDEX        "DICHR#1 RED";
CALIB.TPL5.VALUE1       "UVES_dic1r_cal_flatfree.obdx";
CALIB.TPL5.VALUE2       "UVES_dic1r_cal_wavefree.obdx";
CALIB.TPL5.VALUE3       "UVES_red_cal_bias.obdx";
CALIB.TPL5.VALUE4       "UVES_dic1r_tec_orderdef.obdx";
CALIB.TPL5.VALUE5       "UVES_dic1r_tec_fmtchk.obdx";

# Calibrations for Mode=DICHR#2, path=RED:
CALIB.TPL6.INDEX        "DICHR#2 RED";
CALIB.TPL6.VALUE1       "UVES_dic2r_cal_flatfree.obdx";
CALIB.TPL6.VALUE2       "UVES_dic2r_cal_wavefree.obdx";
CALIB.TPL6.VALUE3       "UVES_red_cal_bias.obdx";
CALIB.TPL6.VALUE4       "UVES_dic2r_tec_orderdef.obdx";
CALIB.TPL6.VALUE5       "UVES_dic2r_tec_fmtchk.obdx";

# Tables:

# Lamps:
#                            'DPR.TYPE' INS.GRATx.NAME RANGE LAMPNR
TABLE1.NAME             "LAMP";
TABLE1.ROW1             "D2L  FLAT CD#1 300-330";
TABLE1.ROW2             "FFL1 FLAT CD#1 330-400";
TABLE1.ROW3             "FFL2 FLAT CD#2 360-480";
TABLE1.ROW4             "FFL3 FLAT CD#3 450-650";
TABLE1.ROW5             "FFL4 FLAT CD#3 650-750";
TABLE1.ROW6             "FFL4 FLAT CD#4 600-950";

TABLE1.ROW7             "TAL  WAVE CD#1 300-400";
```

```
TABLE1.ROW8             "TAL  WAVE CD#2 360-480";
TABLE1.ROW9             "TAL  WAVE CD#3 450-750";
TABLE1.ROW10            "TAL  WAVE CD#4 600-950";

TABLE1.ROW11            "D2L  ORDERDEF CD#1 300-400";
TABLE1.ROW12            "FFL2 ORDERDEF CD#2 360-480";
TABLE1.ROW13            "FFL3 ORDERDEF CD#3 450-650";
TABLE1.ROW14            "FFL4 ORDERDEF CD#3 650-750";
TABLE1.ROW15            "FFL4 ORDERDEF CD#4 600-950";

TABLE1.ROW16            "TAL  FMTCHK CD#1 300-400";
TABLE1.ROW17            "TAL  FMTCHK CD#2 360-480";
TABLE1.ROW18            "TAL  FMTCHK CD#3 450-750";
TABLE1.ROW19            "TAL  FMTCHK CD#4 600-950";

# Table for second lamp exposure:
TABLE2.NAME             "LAMP2";
TABLE2.ROW1             "D2L  FLAT CD#1 300-360";
TABLE2.ROW2             "FFL1 FLAT CD#1 360-400";
TABLE2.ROW3             "FFL2 FLAT CD#2 360-480";
TABLE2.ROW4             "FFL3 FLAT CD#3 450-650";
TABLE2.ROW5             "FFL4 FLAT CD#3 650-750";
TABLE2.ROW6             "FFL4 FLAT CD#4 600-950";

TABLE2.ROW7             "TAL  WAVE CD#1 300-400";
TABLE2.ROW8             "TAL  WAVE CD#2 360-480";
TABLE2.ROW9             "TAL  WAVE CD#3 450-750";
TABLE2.ROW10            "TAL  WAVE CD#4 600-950";

TABLE2.ROW11            "D2L  ORDERDEF CD#1 300-400";
TABLE2.ROW12            "FFL2 ORDERDEF CD#2 360-480";
TABLE2.ROW13            "FFL3 ORDERDEF CD#3 450-650";
TABLE2.ROW14            "FFL4 ORDERDEF CD#3 650-750";
TABLE2.ROW15            "FFL4 ORDERDEF CD#4 600-950";

TABLE2.ROW16            "TAL  FMTCHK CD#1 300-400";
TABLE2.ROW17            "TAL  FMTCHK CD#2 360-480";
TABLE2.ROW18            "TAL  FMTCHK CD#3 450-750";
TABLE2.ROW19            "TAL  FMTCHK CD#4 600-950";

# Detector speeds:
TABLE3.NAME             "DET1.SPEED";
TABLE3.ROW1             "225kHz,1x1,low 1pt/225kHz/lg  1 1";
TABLE3.ROW2             "225kHz,1x2,low 1pt/225kHz/lg  1 2";
TABLE3.ROW3             "50kHz,2x2,high 1pt/50kHz/hg   2 2";
TABLE3.ROW4             "50kHz,2x3,high 1pt/50kHz/hg   2 3";
TABLE3.ROW5             "625kHz,1x1,low 2pts/625kHz/lg 1 1";

TABLE4.NAME             "DET2.SPEED";
TABLE4.ROW1             "225kHz,1x1,low 2pts/225kHz/lg 1 1";
TABLE4.ROW2             "225kHz,1x2,low 2pts/225kHz/lg 1 2";
```

```
TABLE4.ROW3             "50kHz,2x2,high 2pts/50kHz/hg  2 2";
TABLE4.ROW4             "50kHz,2x3,high 2pts/50kHz/hg  2 3";
TABLE4.ROW5             "625kHz,1x1,low 4pts/625kHz/lg 1 1";

# Exposure times for 0.8" slit, low gain, 1x1 binning:
TABLE5.NAME             "TEXP.NORM";
TABLE5.ROW1             "15   TAL  CD#1 300-400";
TABLE5.ROW2             "15   TAL  CD#2 360-480";
TABLE5.ROW3             "15   TAL  CD#3 450-750";
TABLE5.ROW4             "10   TAL  CD#4 600-950";
TABLE5.ROW5             "180  D2L  CD#1 300-400";
TABLE5.ROW6             "15   FFL1 CD#1 300-400";
TABLE5.ROW7             "60   FFL2 CD#2 350-600";
TABLE5.ROW8             "10   FFL3 CD#3 450-650";
TABLE5.ROW9             "30   FFL4 CD#3 650-750";
TABLE5.ROW10            "20   FFL4 CD#4 600-950";
#
# ___oOo___
```

Red path calibration templates

UVES_red_cal_bias.obdx

```
#*******************************************************************************
# E.S.O. - VLT project
#
# "@(#) $Id: UVES_red_cal_bias.obdx,v 1.12 2001/06/30 20:23:50 vltsccm Exp $"
#
# who       when      what
# --------  --------  --------------------------------------------
# aka/rsc   22/07/00  created.

TPL.ID                  "UVES_red_cal_bias"
TPL.NAME                "Red Bias Calibration"
SEQ.NEXPO               "5";
DET2.READ.SPEED         "[TABLE DET2.SPEED $DET.READ.SPEED $DET.WIN1.BINX
                          $DET.WIN1.BINY]";
# --- oOo ---
```

UVES_red_cal_flatfree.obdx

```
#*******************************************************************************
# E.S.O. - VLT project
#
# "@(#) $Id: UVES_red_cal_flatfree.obdx,v 1.12 2001/06/30 20:23:50 vltsccm Exp $"
#
# who       when      what
# --------  --------  --------------------------------------------
# aka       27/02/01  force iodine cell to OUT
# aka/rsc   22/07/00  created.
```

```
TPL.ID                  "UVES_red_cal_flatfree"
TPL.NAME                "Red Free Flat Calibration"
SEQ.NEXPO               "5";
INS.SLIT1.NAME          "FREE";
INS.DPOL.MODE           "$IMAGE:INS.DPOL.MODE";
INS.OPTI1.NAME          "OUT";
INS.OPTI2.NAME          "$IMAGE:INS.OPTI2.NAME";
INS.SLIT3.WID           "$IMAGE:INS.SLIT3.WID";
INS.SLIT3.LEN           "$IMAGE:INS.SLIT3.LEN";
INS.FILT3.NAME          "$IMAGE:INS.FILT3.NAME";
INS.GRAT2.NAME          "$IMAGE:INS.GRAT2.NAME";
INS.GRAT2.WLEN          "$IMAGE:INS.GRAT2.WLEN";
INS.TILT2.POS           "$IMAGE:INS.TILT2.POS";
INS.LAMP                "[TABLE LAMP FLAT $INS.GRAT2.NAME $INS.GRAT2.WLEN]";
DET2.READ.SPEED         "[TABLE DET2.SPEED $DET.READ.SPEED $DET.WIN1.BINX
                          $DET.WIN1.BINY]";
DET2.WIN1.UIT1          "[EXPR "[TABLE TEXP.NORM $INS.LAMP $INS.GRAT2.NAME
                          $INS.GRAT2.WLEN] * (0.8 / $INS.SLIT3.WID) *
                          (0.7 / $DET.OUT1.GAIN) / ($DET.WIN1.BINX *
                          $DET.WIN1.BINY)"]";
# --- oOo ---
```

UVES_red_cal_wavefree.obdx

```
#*******************************************************************************
# E.S.O. - VLT project
#
# "@(#) $Id: UVES_red_cal_wavefree.obdx,v 1.12 2001/06/30 20:23:50 vltsccm Exp $"
#
# who       when      what
# --------  --------  ----------------------------------------------
# aka       27/02/01  force iodine cell to OUT
# aka/rsc   22/07/00  created.

TPL.ID                  "UVES_red_cal_wavefree"
TPL.NAME                "Red Free Wave Calibration"
SEQ.NEXPO               "1";
INS.SLIT1.NAME          "FREE";
INS.DPOL.MODE           "$IMAGE:INS.DPOL.MODE";
INS.OPTI1.NAME          "OUT";
INS.OPTI2.NAME          "$IMAGE:INS.OPTI2.NAME";
INS.SLIT3.WID           "$IMAGE:INS.SLIT3.WID";
INS.SLIT3.LEN           "$IMAGE:INS.SLIT3.LEN";
INS.FILT3.NAME          "$IMAGE:INS.FILT3.NAME";
INS.GRAT2.NAME          "$IMAGE:INS.GRAT2.NAME";
INS.GRAT2.WLEN          "$IMAGE:INS.GRAT2.WLEN";
INS.TILT2.POS           "$IMAGE:INS.TILT2.POS";
INS.LAMP                "[TABLE LAMP WAVE $INS.GRAT2.NAME $INS.GRAT2.WLEN]";
DET2.READ.SPEED         "[TABLE DET2.SPEED $DET.READ.SPEED $DET.WIN1.BINX
                          $DET.WIN1.BINY]";
DET2.WIN1.UIT1          "[EXPR "[TABLE TEXP.NORM $INS.LAMP $INS.GRAT2.NAME
```

```
                          $INS.GRAT2.WLEN] * (0.7 / $DET.OUT1.GAIN) /
                          ($DET.WIN1.BINX * $DET.WIN1.BINY)"]";
# --- oOo ---
```

UVES_red_tec_fmtchk.obdx

```
#*******************************************************************************
# E.S.O. - VLT project
#
# "@(#) $Id: UVES_red_tec_fmtchk.obdx,v 1.12 2001/06/30 20:23:50 vltsccm Exp $"
#
# who       when      what
# --------  --------  --------------------------------------------
# aka/rsc   22/07/00  created.

TPL.ID                  "UVES_red_tec_fmtchk"
TPL.NAME                "Red Format Check"
SEQ.NEXPO               "1";
INS.FILT3.NAME          "$IMAGE:INS.FILT3.NAME";
INS.GRAT2.NAME          "$IMAGE:INS.GRAT2.NAME";
INS.GRAT2.WLEN          "$IMAGE:INS.GRAT2.WLEN";
INS.TILT2.POS           "$IMAGE:INS.TILT2.POS";
DET2.READ.SPEED         "[TABLE DET2.SPEED $DET.READ.SPEED $DET.WIN1.BINX
                          $DET.WIN1.BINY]";
DET2.WIN1.UIT1          "[EXPR "[TABLE TEXP.NORM $INS.LAMP.VALUE
                          $INS.GRAT2.NAME $INS.GRAT2.WLEN] *
                          (0.7 / $DET.OUT1.GAIN) / ($DET.WIN1.BINX *
                          $DET.WIN1.BINY)"]";
# --- oOo ---
```

UVES_red_tec_orderdef.obdx

```
#*******************************************************************************
# E.S.O. - VLT project
#
# "@(#) $Id: UVES_red_tec_orderdef.obdx,v 1.12 2001/06/30 20:23:51 vltsccm Exp $"
#
# who       when      what
# --------  --------  --------------------------------------------
# aka/rsc   22/07/00  created.

TPL.ID                  "UVES_red_tec_orderdef"
TPL.NAME                "Red Order Definition"
SEQ.NEXPO               "1";
INS.FILT3.NAME          "$IMAGE:INS.FILT3.NAME";
INS.GRAT2.NAME          "$IMAGE:INS.GRAT2.NAME";
INS.GRAT2.WLEN          "$IMAGE:INS.GRAT2.WLEN";
INS.TILT2.POS           "$IMAGE:INS.TILT2.POS";
INS.LAMP                "[TABLE LAMP ORDERDEF $INS.GRAT2.NAME $INS.GRAT2.WLEN]";
DET2.READ.SPEED         "[TABLE DET2.SPEED $DET.READ.SPEED $DET.WIN1.BINX
                          $DET.WIN1.BINY]";
```

```
DET2.WIN1.UIT1          "[EXPR "[TABLE TEXP.NORM $INS.LAMP $INS.GRAT2.NAME
                          $INS.GRAT2.WLEN] * (0.8 / $INS.SLIT3.WID.VALUE) *
                          (0.7 / $DET.OUT1.GAIN) / ($DET.WIN1.BINX *
                          $DET.WIN1.BINY)"]";
# --- oOo ---
```