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FOR INFORMATION

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UPDATE ON GUARANTEED TIME ALLOCATIONS ON VLT AND VLTI

Council is invited to take note of this document.

1. Introduction

Guaranteed Time Observing (GTO) was introduced at the start of the VLT Programme initially in order to motivate and reward the manpower expended by instrument consortia in executing an ambitious instrumentation programme going beyond what is possible by ESO alone. Awards for the 1st generation instruments were mostly in the range 40-100 nights leading to a total of ~650 UT nights for FORS1, FORS2, NAOS, CONICA, VISIR, VIMOS, FLAMES, SINFONI, PARSEC, AMBER and MIDI together. All these GTO commitments will have been fulfilled with P92 which started 1 October 2013. The ESO built instruments ISAAC, UVES, CRIRES, HAWK-I and the ESO contributions to the others did not receive any GTO.

In April 1998 document ESO/Cou-619-rev. 2 extended the role of GTO in cooperation with external institutes to include i) non - Member State collaborations, ii) telescopes and sub-systems of the VLTI, and iii) contributions of cash as well as manpower. It also established a formula for linking the amount of GTO to the value of the resources in cash and manpower provided. The current conversions used are 1FTE = 75kEUR and the cost of a VLT (UT) and VISA night (any number of ATs) based on the amortised capital and operational costs are 50kEUR and 29kEUR respectively. All awards of GTO require prior approval by Council.

In December 2004, Council also approved the 'VLT/VLTI Science Operations Policy' (doc. ESO/Cou-996 rev.) which, in its Appendix 2, stipulates a ceiling of 10% of the global VLT/VLTI time on the amount of GTO which may be scheduled in any given semester. In June 2010 Council specified the modalities of GTO allocation in the document ESO/Cou-1301 'Allocation of GTO Proposals'. The change in philosophy plus increases in instrument performance and complexity, cash contributions and inflation have resulted in awards of 150 - 260 UT nights for the VLT/I 2nd generation instruments. The resources provided by the community enabled a larger 2nd generation instrument programme than initially foreseen.

So far, the GTO awarded has been below 10% globally and could also be scheduled within the 10% per semester limit. The last report on the status of GTO was given to Council with document ESO/Cou-1303 in June 2010 up to Period 86. That document already alerted Council to the fact that the arrival of several 2nd generation instruments within a short space of time would generate a potential congestion of GTO with the associated risk of exceeding the 10% limit.

Table 1. VLT GTO allocations as of P92.

Instrument	VLT GTO (nights)	Comments
FORS1+2	78	Closed
ISAAC	0	ESO-built; no GTO
CRIRES	0	ESO-built; no GTO
X-shooter	154.4	Closed
UVES	0	ESO-built; no GTO
FLAMES	74.4	Closed
VIMOS	60.9	Closed
VISIR	67.4	Closed
NACO	101.8	Closed
SINFONI	107	Closed
HAWK-I	0	ESO-built; no GTO
PARSEC	28	Closed
CAMCAO	18	Closed
KMOS	40	210 nights remaining
OmegaCAM	34.6	5.4 nights remaining

2. Current status

The current situation of GTO allocations is summarised in Table 1, which shows that the GTO time scheduled at the UTs since 1999 so far amounts to 764.5 nights. These are the total allocations and in some cases include compensation time (e.g. for technical downtime). All 1st generation instruments have had all their GTO allocated and used, as has X-shooter, the first of the 2nd generation instruments. KMOS is included in Table 1, as its GTO allocation has already started in P92. The VLT allocation of the OmegaCAM GTO follows the original agreement with the consortium and the Council decision to transfer some VST GTO to the VLT (doc. ESO/Cou-1162).

The 2nd generation VLT instruments all carry substantial GTO (Table 2). In total there are 1391 nights committed to GTO for KMOS, SPHERE, MUSE, GRAVITY, MATISSE and ESPRESSO. Given that the GTO should be taken over a five-year period this will lead to GTO allocations well over 10% of the available time in some future periods (see section 3). In addition the GTO requests for ERIS and CRIRES+ are being presented to Council at this meeting for approval. These are shown in Table 3.

The commitment of VLT time coming from VLTI projects other than the 2nd generation instruments amounts to 22.5 nights (Table 4). These are for various contributions to the VLTI (FINITO, LISA, VLTI infrastructure upgrades, star separators).

Table 2. Approved GTO for VLT 2nd generation instruments.

Instrument	GTO Time (UT nights)
KMOS	250
MUSE	225
SPHERE	260
GRAVITY	273
MATISSE	150
ESPRESSO	233

Table 3. GTO to be approved for ERIS and CRIRES+.

Instrument	GTO Time (UT nights)
ERIS	127
CRIRES+	62

Table 4. Approved VLTI GTO to be taken at the UTs. In some cases the instrument is not specified and is indicated with a question mark.

Consortium	Instrument	Scheduled time (nights)	Contract (nights)	Remaining time	Comments
AMBER	AMBER	73.3	60	0.0	Including compensation. Closed
FINITO-Torino	MIDI? PRIMA?	1.0	8	7.0	Not started
LISA-MPG	?	2.5	2.5	0.0	2.5 SINFONI nights in P88
MIDI	MIDI	84.2	60	0.0	Including compensation. Closed
STS-Cologne	NACO,SINFONI, PIONIER	12.5	19	6.5	
STS-MPE	PRIMA?	10.0	19	9.0	10 nights with SINFONI
VLTI-Enhance-CNRS	AMBER, PIONIER	11.6	11.6	0.0	Closed

Table 5. GTO for VISA (excluding GRAVITY and MATISSE).

Consortium	Instrument	Scheduled time (nights)	Contract (nights)	Remaining time	Comments
AMBER	AMBER	143.0	133.3	0.0	Including compensation. Closed
DDL-HW	PRIMA		128	128.0	Not started
DDL-SW	PRIMA		92	92.0	Not started
FINITO-Torino	MIDI	2.0	12	10.0	
MIDI	MIDI, PIONIER	107.5	118.9	0.0	Including compensation. Closed in P92
VISA-Belgium	AMBER, PIONIER	116.9	138	21.1	
VISA-CNRS	AMBER, PIONIER	66.9	67	1.4	1.4 nights of compensation (in P93)
VISA-Italy	AMBER	25.0	24	-1.0	Including compensation. Closed
VISA-MPG	AMBER, MIDI	41.9	69	27.1	
VISA-NEVEC	MIDI	9.3	44	34.8	
VISA-Switzerland	AMBER, MIDI	16.2	24	7.8	

The situation of GTO on the auxiliary telescopes was clarified recently with the AMBER and the MIDI consortia. They will both exhaust their GTO allocation in P92. Table 5 shows that there remain 320.8 nights of GTO with VLTI and the ATs. Of these 220 are for PRIMA and have not been started. The GTO allocations for MATISSE and GRAVITY with VISA are 173 and 157 nights, respectively, and need to be added to the above, bringing the total to 650.8.

3. Forecast

This section presents a forecast of the GTO load on the UTs resulting from the start of operations of the second generation VLT instruments with the allocations as given in Table 2 and Table 3: KMOS (starting in P92 – 2013), MUSE (starting 2014), SPHERE and GRAVITY (2015), ESPRESSO (2016), MATISSE (2017), ERIS (2019) and CRIRES+ (2018). The forecast is based on the current plans for the deployment of the various instruments. The GTO fraction was computed assuming 150 nights of available science time per UT per semester, which is a typical number for normal periods (the remaining nights are allocated to technical time, calibration plan and VLTI).

Figure 1 illustrates the forecast based on the assumptions that i) the delivery of the instruments remains on the currently foreseen schedule, and ii) the time is evenly distributed across the periods (as typically done in the past for other VLT instruments). It shows that the GTO allocation will break the formal 10% limit already in P95, reaching a peak of over 20% in P100. The GTO load will start to decrease with P102. The GTO-load averaged over the 16 semesters (periods 92 to 107) is 14.0%. Figure 2 gives a breakdown for the individual instruments in GTO nights. It can be seen that the peak is caused by the arrival of many 2nd generation instruments within a short time span.

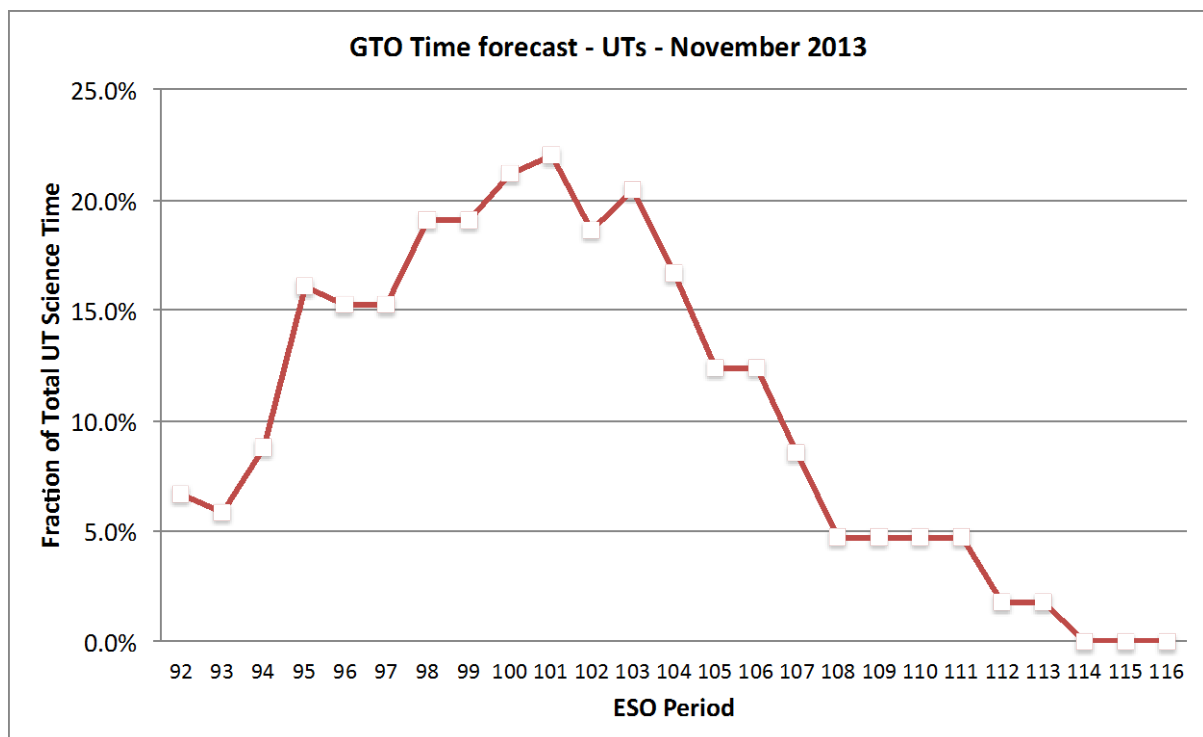


Figure 1. Forecast of GTO allocations at the VLT.

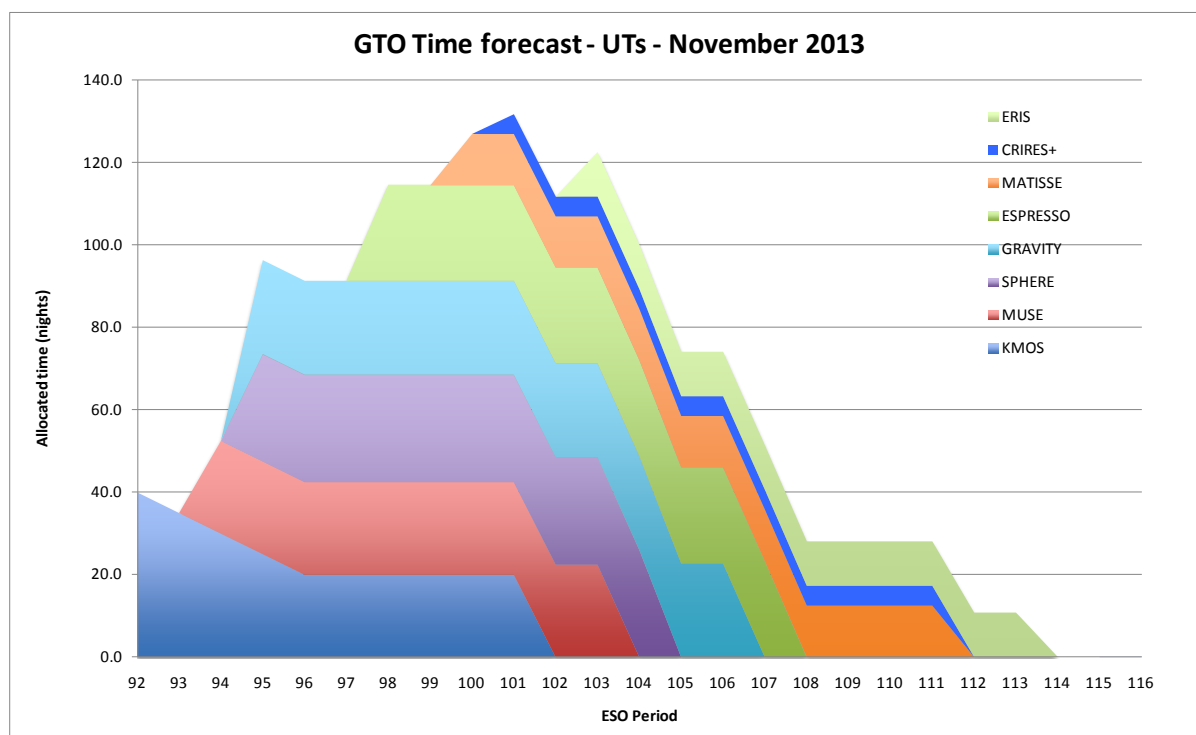


Figure 2. Forecast of the GTO allocation (in nights) per instrument.

In order to mitigate this situation slightly it was decided to front-load the KMOS GTO allocation and allocate a higher fraction of GTO nights in the first semesters. Hence the following allocations are envisaged: 40 nights (P92), 35 (P93), 30 (P94), 25 (P95) and 20 nights per semester for the remaining three years.

Although the actual load on the UTs in each single period will depend on a number of factors, most importantly the exact timeline for the instrument deployment, the 10% limit set in the VLT Science Policy will need to be exceeded in the coming years.

4. Council action

Council is asked to note this document.