



EUROPEAN SOUTHERN OBSERVATORY

# Very Large Telescope

## FLAMES TEMPLATES REFERENCE MANUAL

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**TABLE OF CONTENTS**

<b>1</b>	<b>List of acronyms and abbreviations</b>	<b>1</b>
<b>2</b>	<b>References</b>	<b>1</b>
<b>3</b>	<b>Introduction</b>	<b>2</b>
<b>4</b>	<b>Template names</b>	<b>2</b>
4.1	TSF Keywords .....	2
<b>5</b>	<b>Template list</b>	<b>3</b>
<b>6</b>	<b>Acquisition templates</b>	<b>5</b>
6.1	FLAMES_uves_acq .....	6
6.2	FLAMES_giraf_acq .....	7
6.3	FLAMES_com_acq .....	8
6.4	FLAMES_giraf_acq_argfast .....	8
<b>7</b>	<b>Observation templates</b>	<b>10</b>
7.1	FLAMES_uves_obs_exp .....	10
7.2	FLAMES_giraf_obs_exp .....	10
7.3	FLAMES_com_obs_exp .....	12
7.4	FLAMES_giraf_obs_argoff .....	12
7.5	FLAMES_giraf_obs_argstd .....	12
7.6	FLAMES_giraf_obs_ifustd .....	13
<b>8</b>	<b>Calibration templates</b>	<b>14</b>
8.1	Attached calibration .....	14
8.2	Detector calibration .....	14
8.3	Stand-alone calibration .....	15
8.4	Technical calibration .....	15
<b>APPENDIX:</b>		
<b>A</b>	<b>FLAMES Template Signature Files</b>	<b>17</b>
<b>B</b>	<b>FLAMES Template Signature Files: calibration and technical</b>	<b>30</b>

## 1. List of acronyms and abbreviations

<b>AT</b>	Acquisition Template
<b>ARGUS</b>	Giraffe Integral Field Spectroscopy mode
<b>BOB</b>	Broker of Observation Blocks
<b>CCD</b>	Charge-Coupled Device
<b>CCS</b>	Central Control Software
<b>CT</b>	Calibration Template
<b>FACB</b>	Field Acquisition Coherent Bundle
<b>FFL</b>	Flat Field Lamp
<b>FLAMES</b>	VLT Multi Object Fiber Facility
<b>FP</b>	Fiber Positioner
<b>FPOSS</b>	Fibre Positioner Observation Support Software
<b>GIRAFFE</b>	Spectrograph, part of Flames
<b>IFU</b>	Integral Field Unit
<b>MEDUSA</b>	Multi-Object Spectroscopy mode
<b>MOS</b>	VLT Multi-Object slit spectrograph
<b>OB</b>	Observation Block
<b>OT</b>	Observation Template
<b>P2PP</b>	Phase II Proposal Preparation
<b>TAL</b>	Th-Ar Lamp
<b>TSF</b>	Template Signature File
<b>UVES</b>	UV Visual Echelle Spectrograph

## 2. REFERENCES

[1] FLAMES Templates Reference Guide, VLT-PLA-ESO-13700-1995, V 1.0

[2] P2PP User's Manual, VLT-MAN-ESO-19200-1644, V 2.2

[3] INS Common Software for Templates -User Manual, VLT-MAN-ESO-17240-2240, V 2

[4] FLAMES User Manual, VLT-MAN-ESO-13700-2994, V 83.1

[5] HOS/BOB User Manual, VLT-MAN-ESO-17220-1332, V 2.0

[6] FPOSS User Manual, INS-MAN-AUS-13721-0079, V 83.1

### 3. INTRODUCTION

This document describes the first the FLAMES (Fibre Large Array Multi Element Spectrograph) **Templates**.

The reader of this reference manual is assumed to be familiar with the FLAMES instrument (ref. [4]), with the P2PP tool (ref. [2]) and with the FPOSS preparation software (ref. [6]).

FLAMES templates are characterised by the TSFs (Template Signature Files) allowing the user to create OBs (Observation Blocks) of science and calibration exposures. The templates are the building blocks of science and calibration OBs.

### 4. TEMPLATE NAMES

FLAMES TSFs are divided into groups according to the functions to be performed.

The name of a TSF has the following scheme:

$$\text{FLAMES\_}<mode>\_<type>\_ [<description>].tsf$$

where

*mode* is the name of instrument mode (may be: *uves*, *giraf*, *com*)

*type* is the type of template (may be: *acq*, *obs*, *cal* or *tec*)

*description* is an optional string identifying the purpose of the template

(*exp* for a science exposure, *dark* for a dark exposure, *bias* for a detector bias frame, *flatatt* for an attached flat field exposure, *flat* for a standalone flat field exposure, *wave* for a standalone wavelength calibration exposure).

#### 4.1 TSF keywords

Every TSF specifies and uses a Reference Setup File, which contains the setting of all keywords needed to perform one or more observations foreseen by that template.

Keywords appearing in FLAMES TSFs are:

1. Keywords whose value has to be set by the user (through the P2PP tool).
2. Keywords whose value is fixed for a given template but cannot be put in the Reference Setup File (because this file is shared among different templates).

Obviously, fixed keywords can not be set by the user at P2PP level and hence they are not visible.

## 5. TEMPLATE LIST

FLAMES has 3 modes:

1. **UVES** : fibers feed the RED arm of the UVES spectrograph
2. **GIRAFFE** : fibers feed the GIRAFFE spectrograph
3. **COMBINED**: fibers feed both the UVES and the GIRAFFE spectrographs, allowing simultaneous observations.

The following two tables list the available FLAMES templates.

Table 1 lists the templates, which are supplied to the users together with the P2PP tool for the preparation of their science OBs.

Type	Name
<i>ACQUISITION TEMPLATES</i>	<b>FLAMES_uves_acq</b> <b>FLAMES_giraf_acq</b> <b>FLAMES_com_acq</b> <b>FLAMES_giraf_acq_argfast</b>
<i>OBSERVATION TEMPLATES</i>	<b>FLAMES_uves_obs_exp</b> <b>FLAMES_giraf_obs_exp</b> <b>FLAMES_com_obs_exp</b> <b>FLAMES_giraf_obs_argoff</b> <b>FLAMES_giraf_obs_argstd</b> <b>FLAMES_giraf_obs_ifustd</b>

Type	Name
<i>CALIBRATION TEMPLATES</i>	<b>FLAMES_uves_cal_flatatt</b> <b>FLAMES_giraf_cal_flatatt</b> <b>FLAMES_com_cal_flatatt</b>

Table 1 - Science and nighttime calibration templates

Table 2 lists the TSFs that are in addition available only at the Paranal observatory. These templates are used for calibration purposes by the Paranal Science Operations team.

Type	Name
<p><i>CALIBRATION</i></p> <p>&amp;</p> <p><i>TECHNICAL</i></p> <p><i>TEMPLATES</i></p>	<p><b>FLAMES_uves_cal_dark</b></p> <p><b>FLAMES_uves_cal_bias</b></p> <p><b>FLAMES_uves_cal_flat</b></p> <p><b>FLAMES_uves_cal_wave</b></p> <p><b>FLAMES_uves_tec_fmtchk</b></p> <p><b>FLAMES_uves_tec_orderdef</b></p> <p><b>FLAMES_uves_tec_sflat</b></p> <p><b>FLAMES_giraf_cal_dark</b></p> <p><b>FLAMES_giraf_cal_bias</b></p> <p><b>FLAMES_giraf_cal_flat</b></p> <p><b>FLAMES_giraf_cal_wave</b></p>

Table 2 - Daytime calibration and technical Templates

## 6. ACQUISITION TEMPLATES

The FLAMES instrument package contains four acquisition templates (cf. Table 1): the first three correspond to the three instrument modes (see sect. 6.1, 6.2 and 6.3). The fourth template is used for *fast* acquisition in the ARGUS mode of GIRAFFE only (see sect. 6.4).

For the first three templates the corresponding fiber combination (cf. Table 3) is selected by the user at the level of FPOSS (Fiber Positioner Observing Support Software, ref. [6]), and saved in a ‘Target Setup File’. This parameter file contains the instrument modes and the coordinates of the field center, of the targets, of the VLT guide star, and of the fiducial stars. The latter are required for the acquisition of the field using up to four imaging fiber bundles, the so-called FACBs (fiber acquisition coherent bundles).

In P2PP this ‘Target Setup File’ has to be attached to the corresponding acquisition template and will be passed on to the FLAMES instrument for the configuration and observation of the field.

<i>Instrument Mode</i>	<i>Instrument Sub-Mode</i> (fibre combination)	Instrument Keywords		
		<i>INS.MODE</i> (FLAMES mode)	<i>INS.GIRAF.MODE</i> (Giraffe mode)	<i>INS.UVES.SLIT</i> (Uves slit mode)
<b>UVES</b>	<b>UVES</b> (8 fibres)	<b>UVES</b>	-	<b>8FIB</b>
	<b>UVES</b> (7 fibres + 1 calibration)	<b>UVES</b>	-	<b>7+1FIB</b>
	<b>UVES</b> (6 fibres for 520 setting)	<b>UVES</b>	-	<b>6FIB</b>
<b>GIRAFFE</b>	<b>MEDUSA</b>	<b>GIRAF</b>	<b>MED</b>	-
	<b>IFU</b>	<b>GIRAF</b>	<b>IFU</b>	-
	<b>ARGUS sky</b>	<b>GIRAF</b>	<b>ARG</b>	-
<b>COMBINED</b>	<b>MEDUSA + UVES</b> (8 fibres)	<b>COM</b>	<b>MED</b>	<b>8FIB</b>
	<b>MEDUSA + UVES</b> (7+1 fibres)	<b>COM</b>	<b>MED</b>	<b>7+1FIB</b>
	<b>MEDUSA + UVES</b> (6 fibres)	<b>COM</b>	<b>MED</b>	<b>6FIB</b>
	<b>IFU + UVES</b> (8 fibres)	<b>COM</b>	<b>IFU</b>	<b>8FIB</b>
	<b>IFU + UVES</b> (7+1 fibres)	<b>COM</b>	<b>IFU</b>	<b>7+1FIB</b>
	<b>IFU + UVES</b> (6 fibres)	<b>COM</b>	<b>IFU</b>	<b>6FIB</b>
	<b>ARGUS + UVES</b> (8 fibres)	<b>COM</b>	<b>ARG</b>	<b>8FIB</b>
	<b>ARGUS + UVES</b> (7+1 fibres)	<b>COM</b>	<b>ARG</b>	<b>7+1FIB</b>
	<b>ARGUS + UVES</b> (6 fibres)	<b>COM</b>	<b>ARG</b>	<b>6FIB</b>

Table 3 - FLAMES modes and fibre combinations

The name of the ‘Target Setup File’ follows the scheme:

$$\langle FieldName \rangle . \langle Mode \rangle . \langle TimeStamp \rangle . ins$$

where *FieldName* is the field label given by the user (at FPOSS level), *Mode* is the fibre combination used and *TimeStamp* is the time (*hhmmss*) of day when file is saved.

This convention ensures the uniqueness of the file name. As further check for the user, all parameters stored in the ‘Target Setup File’ will be visible in P2PP when the user selects the file.

A preview window as part of the file selector box displays the contents of the selected file (Figure 2).

It is recommended to check in the preview window the defined *instrument mode* of the ‘Target Setup File’, which is reported in the keyword *INS.MODE*. In the following this mode has to match the mode of the corresponding acquisition, observation, and calibration templates from which the OB is composed.

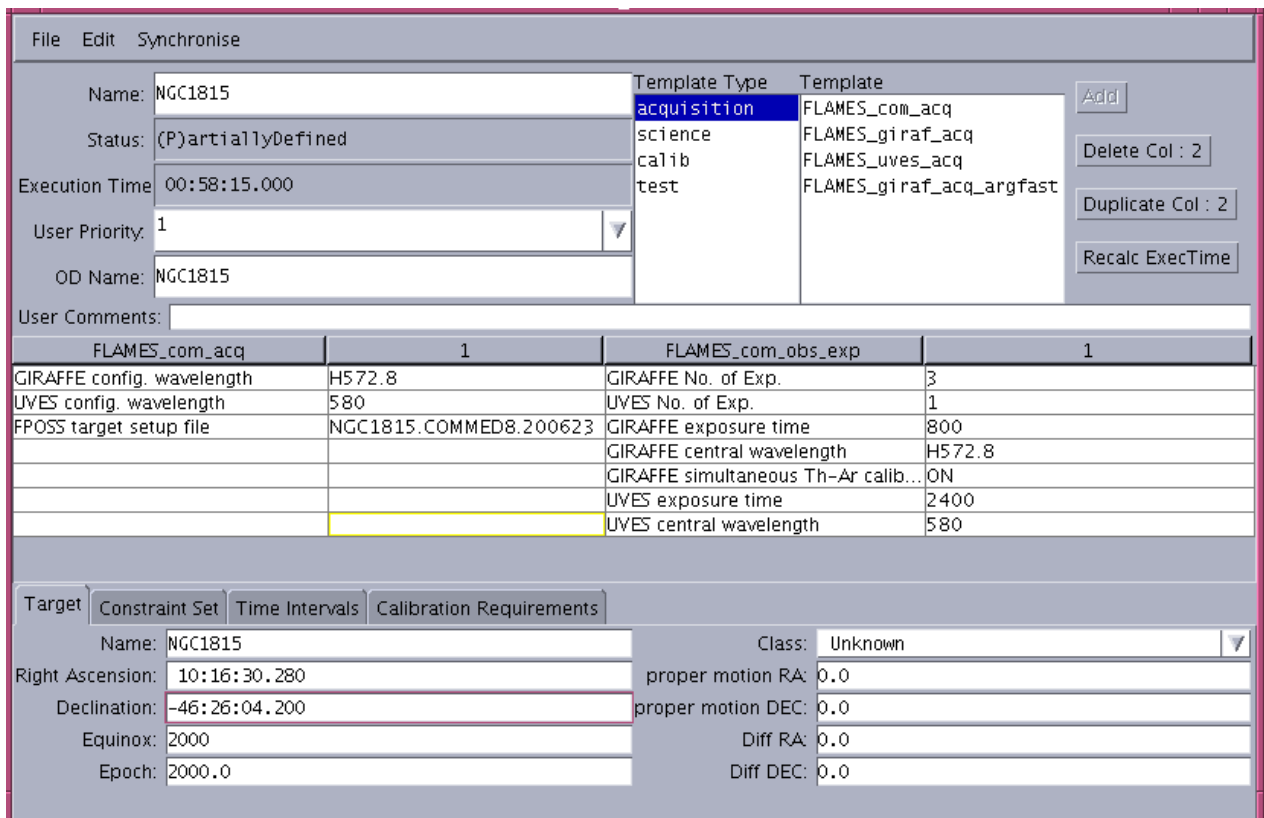


Figure 1 - P2PP window: FLAMES acquisition template

The field as defined in the ‘Target Setup File’ is eventually configured on the fiber positioner plate for a given time, i.e., the *configuration time*, which is usually set to the mid-time of the science exposures contained in the OB. For the fibre positioner to be able to compute the configuration time at the time of the configuration of the plate, the total execution time of the OB must be known. This execution time is computed automatically by external scripts within P2PP. The calculated time includes an

estimate for the execution time of the acquisition template of 900 sec.

The FLAMES acquisition templates require configuration wavelengths to be specified by the user. These wavelength settings can be selected by the user from a *combo box* which reports all UVES and/or GIRAFFE wavelength settings, respectively. The GIRAFFE wavelengths are preceded by the character 'L' or 'H' indicating if the setting belongs to the Low or High resolution mode of the GIRAFFE spectrograph. Additionally, eight of the High resolution setups have the same central wavelength but use a different order sorting filter. These setups are for example denoted H805.3A, H805.3B, H920.5A, H920.5B.

**Note** that the selected configuration wavelengths must *match* the wavelength setting(s) selected in the Observation Templates of the same OB to avoid increased light losses at the fibre entrances due to atmospheric dispersion effects.

### 6.1 FLAMES\_uves\_acq

This template must be chosen when FLAMES is used with the UVES spectrograph alone.

The user has to specify the following parameters:

- 1) Config. wavelength
- 2) FPOSS target setup file

The field will be configured for the given wavelength appropriate to the airmass of observation and observation length. This observation length is automatically calculated within P2PP. In addition, during the observation of the field on the sky the telescope will track at the same given wavelength to compensate for atmospheric dispersion effects.

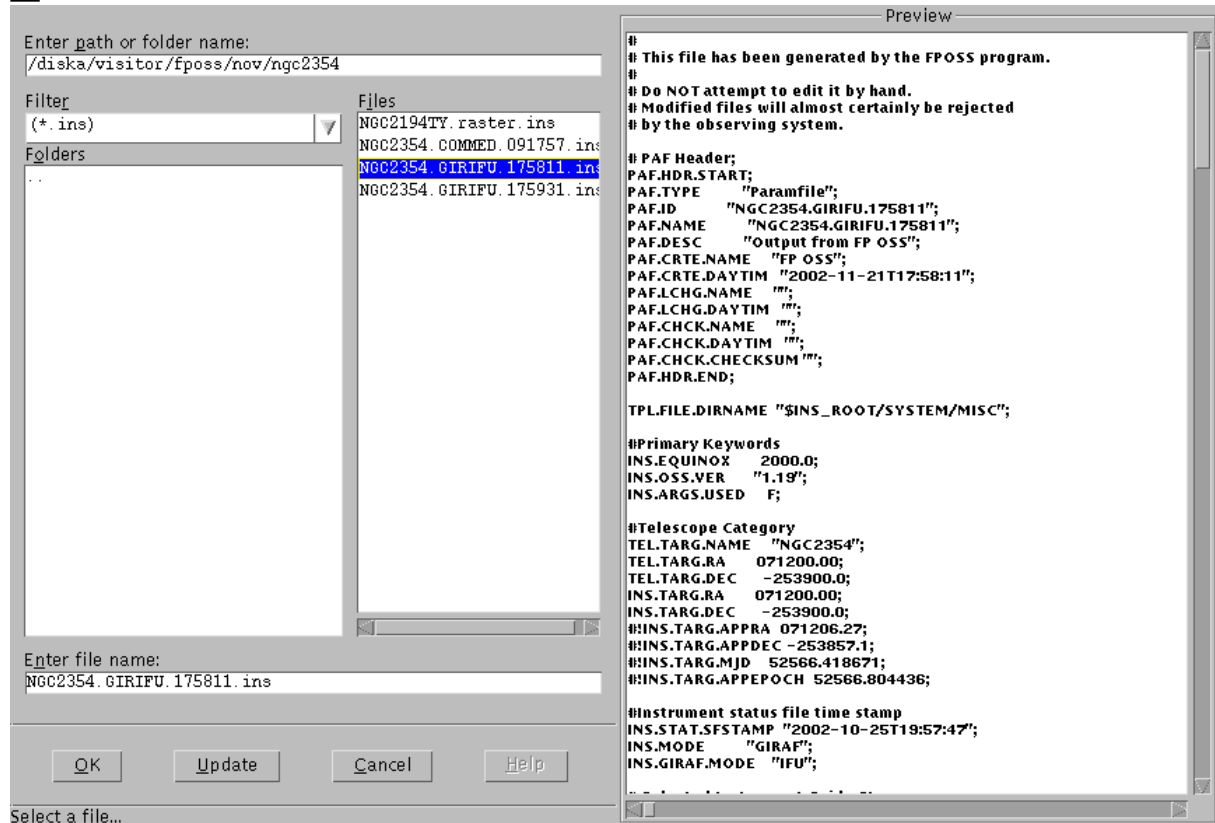


Figure 2 - P2PP preview window for the Target Setup File

## 6.2 FLAMES\_giraf\_acq

This template must be chosen when FLAMES is used with the GIRAFFE spectrograph alone.

The user has to specify the following parameters

- 1) Config. wavelength
- 2) FPOSS target setup file

The field will be configured for the given wavelength appropriate to the airmass of observation and the observation length. This observation length is automatically calculated within P2PP. In addition, during the observation of the field on the sky the telescope will track at the same given wavelength to compensate for atmospheric dispersion effects.

### 6.3 FLAMES\_com\_acq

This template must be used when FLAMES is used in one of the COMBINED modes of GIRAFFE and UVES. The user has to specify the following parameters (as an example cf. Figure 1):

- 1) GIRAFFE config. wavelength
- 2) UVES config. wavelength
- 3) FPOSS target setup File

The GIRAFFE fibres in the field will be configured for the given GIRAFFE wavelength, the UVES fibres for the UVES wavelength. However, for the telescope tracking wavelength, preference will be given to the GIRAFFE wavelength. Therefore, it is important to avoid large differences in the GIRAFFE and UVES wavelengths which would lead to increased fiber entrance losses for the UVES fibres in particular for long exposures at higher airmasses. The positioning of the fibres also requires the observation ltime (and hence OB length); this is calculated automatically within P2PP.

### 6.4 FLAMES\_giraf\_acq\_argfast

This template can be used if the ARGUS integral field unit is used in *fast* acquisition mode. In this mode, no target setup file needs to be created with FPOSS. The preset to the target will be executed blindly with the telescope. The accuracy of the centering of the target relies alone on the accuracy of the target and the VLT guidestar coordinates which should be provided in the same astrometric system. No further acquisition corrections with the FACBs can be carried out in this case. The ARGUS Sky fibres can either remain parked outside the field of view or can be placed on a fixed radius around the ARGUS IFU.

The purpose of the fast ARGUS acquisition is to allow an observer in *visitor mode* to preset from one target to the next *without* reconfiguring the fibres on the plate on which the ARGUS IFU is located. As long as the radius on which the sky fibres are placed and the ARGUS scale are not changed, the plate will not be reconfigured when presetting to the next target. This approach saves about 25 minutes of overhead between two ARGUS observations. In service mode, the regular acquisitions (as described in sect. 6.1, 6.2, 6.3) with FPOSS prepared target setup files must be used. Here, the overheads will be compensated by alternating ARGUS observations with MEDUSA, IFU, or UVES fibre configurations. For the fast acquisition template the following parameters have to be specified by the user:

- 1) Right Ascension of the target
- 2) Declination of the target
- 3) Equinox of the target
- 4) Epoch of coordinates
- 5) Differential tracking velocity in Right Ascension
- 6) Differential tracking velocity in Declination

12

- 7) Guide Star Mode
- 8) Right Ascension of the guide star (if 6 set to 'SETUPFILE')
- 9) Declination of the guide star (if 6 set to 'SETUPFILE')
- 10) Config. wavelength
- 11) Argus position angle on sky
- 12) Argus scale
- 13) Flag if Argus sky fibres parked. If parked set to 'T'. If sky fibres used, set to 'F'.
- 14) Argus sky fibre radius (if 12 set to 'F')

In addition to the target coordinates epoch and equinox, the fast acquisition template allows to specify differential tracking velocities for moving targets. The mode for the guide star is by default set to 'CATALOGUE', meaning the guide star is selected from the VLT guide star catalogues. This can lead to errors if for example the guide star has a large proper motion. If set to 'SETUPFILE', the specific guide star selected with the coordinates given in the fields below will be used. If the target and guide star coordinates are taken from the same astrometric catalogue (and are corrected for proper motion), a high precision in the centering of the target on the ARGUS IFU can be achieved and only depends on the residual error between these two coordinates.

During the observations the telescope will track on the configuration wavelength, which must match the Giraffe wavelength in the observing template. Further, the ARGUS position angle (PA) on sky must be specified. For PA=0, the long axis of the ARGUS array is aligned with the N – S, for PA=90, the long axis is aligned with E – W. The user can choose between two ARGUS scales: 1:1 corresponding to 0.52" per microlens or 1:1.67 corresponding to 0.3" per microlens.

A flag decides if the ARGUS sky fibres will remain parked outside the plate; if set to false, all ARGUS sky fibres will be placed on the plate equidistantly at the radius specified in the last field. If set to true, then the sky fibres will remain on the porch. Finally, we note that for the ARGUS FAST mode, no UVES fibres are available.

## 7. OBSERVATION TEMPLATES

The FLAMES instrument package contains five observing templates (cf. Table 1), i.e., three for the different instrument modes using target setup files and two for the use with the Argus fast acquisition.

**Note:** in the following, the observation template must be selected according to the *mode* previously selected in the *acquisition template*. Further this mode must match the mode defined in the keyword INS.MODE of the *Target Setup File*.

If these conditions are not fulfilled, the OB will fail at execution time.

### 7.1 FLAMES\_uves\_obs\_exp

The UVES observation template requires the following three parameter selections :

- 1) Central wavelength
- 2) Exposure time
- 3) No. of exposures

The user can choose from the ‘Central wavelength’ *combo box* one of the three predefined standard wavelength settings of the red arm of the UVES spectrograph:

**520, 580, 860.**

All other instrumental configurations like cross disperser number and filter name are predefined and do not have to be selected.

### 7.2 FLAMES\_giraf\_obs\_exp

The GIRAFFE observation template requires the following three parameter selections :

- 1) Central wavelength
- 2) Simultaneous Th-Ar calibration lamp
- 3) Exposure time
- 4) No. of exposures

The user can choose from the ‘Central wavelength’ *combo box* one of the 39 predefined resolution and wavelength settings (8 in Low and 31 in High resolution) of the GIRAFFE spectrograph:

**L385.7, L427.2, L479.7, L543.1, L614.2,  
L682.2, L773.4, L881.7,**

**H379.0, H395.8, H412.4, H429.7, H447.1A, H447.1B,  
H465.6, H484.5A, H484.5B, H504.8, H525.8A, H525.8B, H548.8,  
H572.8, H599.3, H627.3, H651.5A, H651.5B, H665.0, H679.7,  
H710.5, H737.0A, H737.0B, H769.1, H805.3A, H805.3B  
H836.6A, H836.6B, H875.7, H920.5A, H920.5B .**

Recall that the ‘B’ settings have a higher resolution (as they work in higher order) but lower throughput than the ‘A’ settings, but the same central wavelength. In addition to the central wavelength, the status of the ‘Simultaneous Th-Ar calibration lamp’ must be selected. As default, the Thorium-Argon hollow cathode lamp is selected to be ‘ON’ during the GIRAFFE exposure. If ‘OFF’ is selected, no simultaneous calibration lamp will be switched on during the GIRAFFE exposure. The latter is recommended to avoid contamination of the object spectra by strong Argon lines in the simultaneous calibration spectra, or if observing faint objects with fibres on the GIRAFFE CCD adjacent or near to the SimCal fibres. Note that very strong Argon lines are found at wavelengths larger than 700nm.

### **7.3 FLAMES\_com\_obs\_exp**

The COMBINED observation template for simultaneous UVES and GIRAFFE observations requires the following seven parameter selections which are simply the combination of the UVES and GIRAFFE parameters as described above :

- 1) GIRAFFE central wavelength
- 2) GIRAFFE simultaneous Th-Ar calib. lamp
- 3) GIRAFFE exposure time
- 4) GIRAFFE No. of exposures
- 5) UVES central wavelength
- 6) UVES exposure time
- 7) UVES No. of exposures

### **7.4 FLAMES\_giraf\_obs\_argoff**

This observing template is mostly identical with the FLAMES\_giraf\_obs\_exp template but allows the user to offset the ARGUS IFU on the sky between subsequent exposures e.g to obtain dithered images of a larger area on the sky. For this purpose the templates requires three additional parameters:

- 5) No. of offsets
- 6) List of offsets in Right Ascension

## 7) List of offsets in Declination

The number of offsets parameter specifies how many offsets from the subsequent list of RA and DEC offsets will be executed. If the list is shorter than the number of offsets, the list will be cycled through. At each offset position the specified number of exposures is taken. The specified offsets are offsets to the telescope position. At the end of the template, the telescope is centered back to the original position. Note, that the ARGUS sky fibres will offset together with the ARGUS IFU.

**7.5 FLAMES\_giraf\_obs\_argstd**

Same as the FLAMES\_giraf\_obs\_argoff observing template but for the observation of spectrophotometric standard stars in the ARGUS mode. The template allows to offset the star on the ARGUS IFU using the offset parameters described above. Spectrophotometric standard stars observed with this template can be automatically identified in the archive or by the data reduction pipeline as standard star calibrations from their FITS header keywords (DPR.CATG=CALIB and DPR.TYPE=STD).

**7.6 FLAMES\_giraf\_obs\_ifustd**

Same as the FLAMES\_giraf\_obs\_exp observing template but for the observation of spectrophotometric standard stars in the IFU mode. Spectrophotometric standard stars observed with this template can be automatically identified in the archive or by the data reduction pipeline as standard star calibrations from their FITS header keywords (DPR.CATG=CALIB and DPR.TYPE=STD).

File Edit Synchronise

Name: NGC1815      Template Type: acquisition      Template: FLAMES\_com\_obs\_exp      Add

Status: (P)artiallyDefined      science      FLAMES\_gi raf\_obs\_exp      Delete Col : 4

Execution Time: 00:58:15.000      calib      FLAMES\_uves\_obs\_exp      Duplicate Col : 4

User Priority: 1      test      FLAMES\_gi raf\_obs\_argoff

OD Name: NGC1815      FLAMES\_gi raf\_obs\_argstd      Recalc ExecTime

User Comments:

FLAMES_com_acq	1	FLAMES_com_obs_exp	1
GIRAFFE config. wavelength	H805.3B	GIRAFFE No. of Exp.	3
UVES config. wavelength	860	UVES No. of Exp.	1
FPOSS target setup file	NGC1815.COMMED8.200623	GIRAFFE exposure time	800
		GIRAFFE central wavelength	H805.3B
		GIRAFFE simultaneous Th-Ar calib...	H737.0
		UVES exposure time	H769.1
		UVES central wavelength	H805.3A
			H805.3B
			H836.6
			H875.7
			H920.5A
			H920.5B

Target      Constraint Set      Time Intervals      Calibration Requirements

Name: NGC1815      Class: Unknown

Right Ascension: 10:16:30.280      proper motion RA: 0.0

Declination: -46:26:04.200      proper motion DEC: 0.0

Equinox: 2000      Diff RA: 0.0

Epoch: 2000.0      Diff DEC: 0.0

Figure 3 - Acquisition and observing template with an opened *combo box* for the wavelength

## **8. CALIBRATION TEMPLATES**

As a general rule (see ref. [4]), FLAMES calibrations will be taken during the day. With the exception of the *attached* calibration templates, the user does not have to prepare any calibration OB. Calibrations will be provided by Paranal Science Operation team, following the FLAMES Calibration Plan.

Calibration templates are grouped in: *attached* calibration, *detector* calibration, *Stand-alone* calibration and *technical* calibration.

### **8.1 Attached calibration**

The attached calibration templates are offered to the user to perform *flatfield* calibrations in exactly the same fiber configuration as the science observation. Hence, the fibre, rotator, and instrument setup will remain as of the end of the preceding observation template. The telescope, however, will be preset to the zenith to allow the insertion of the flatfield screen in front of the observing plate.

Since this type of attached flatfield calibrations is time consuming and is normally carried out during the night, they are only recommended for observations, which require the best possible flatfielding performance. For most observing programs the standard daytime flatfield calibrations as delivered by the observatory are sufficient. In visitor mode attached flatfields can be taken during the daytime, time permitting.

The following attached calibration templates are available:

**FLAMES\_uves\_cal\_flatatt**

**FLAMES\_giraf\_cal\_flatatt**

**FLAMES\_com\_cal\_flatatt**

An *attached* calibration templates must be inserted as the last template of an OB after at least one observation template. The mode must match the mode of the observations template.

As the only parameter, the ‘No. of exposures’ for the GIRAFFE, UVES or both spectrographs must be defined. The exposure times for the flatfield calibrations are taken from a lookup table maintained in the FLAMES instrument and are available in the FLAMES User manual.

### **8.2 Detector calibration**

Four templates are available in order to perform detector calibrations:

**FLAMES\_uves\_cal\_dark**    **FLAMES\_uves\_cal\_bias**

**FLAMES\_giraf\_cal\_dark**   **FLAMES\_giraf\_cal\_bias**

For a *dark* exposure the exposure time and the number of exposures must be specified. For a *bias* exposure only the number of exposures is required.

**8.3 Stand-alone calibration**

Daytime flatfield and wavelength calibrations are obtained by the Paranal observatory with the following calibration templates:

**FLAMES\_uves\_cal\_flat**

**FLAMES\_giraf\_cal\_flat**

**FLAMES\_uves\_cal\_wave**

**FLAMES\_giraf\_cal\_wave**

For UVES the user has to choose the *Uves slit mode* needed for the calibration: 8FIB, 7+1FIB or 6FIB. Other parameters to be chosen are the number of exposures, central wavelength and Plate name (number 1 or 2).

For UVES it is also necessary to specify which fibres group will be used for the calibration: ODD fibres, EVEN fibres, ALL (i.e. Odd+Even) fibres, or a sequence of all 3 types (ODD+EVEN+ALL).

Both *flat-field* and *wavelength* calibrations are performed by setting fibres on a 360° spiral pattern and illuminating them with a fibre projector which is located close to the gripper of the robot. The spiral pattern is defined by the Start and the End radius which has to be specified in the template.

The light of different calibration lamps can be fed to the fiber projector depending on the type of calibration, i.e., with a Tungsten lamp for flatfield exposures, and a Thorium-Argon or a Neon lamp for wavelength calibrations.

The fibers can be illuminated in two different ways: either by sweeping over the fibres along the spiral pattern or by visiting each individual fiber for a given time. The number of sweeps over the fibres or the time to visit each button must be specified, respectively.

Further, the user has to set (or unset) two final technical flags needed to know if Uves fibres must be parked before starting calibration template and if fibres must be configured on the spiral before the calibration.

The exposure time (intended as *shutter* opening time) is not requested to be defined by the user but is automatically computed according to either the number of defined sweeps or the number of fibres and their visiting time.

#### **8.4 Technical calibration**

These templates are used for technical calibrations of UVES only. They are:

**FLAMES\_uves\_tec\_fmtchk**

**FLAMES\_uves\_tec\_orderdef**

**FLAMES\_uves\_tec\_sflat**

The first template performs the format check calibration using the UVES internal *simultaneous wavelength calibration* lamp.

The second has been devised to localize the echelle orders using the UVES internal *simultaneous flatfield calibration* lamp.

The third template is the only FLAMES template which does not make use of fibres, but provides regular UVES *slit flatfield* calibrations. However, the template allows to shift the slit along its long axis to illuminate the locations of all 9 UVES fibers per subslit.

Tables B10, B11 and B12 provide a complete list of all *keywords* (both free and fixed) of these templates.

## A. FLAMES Template Signature Files

In the following Tables all FLAMES TSFs are listed with their free and fixed parameters. For the acquisition templates also keywords supplied and available from the FPOSS target setup file are reported.

When using the P2PP tool the user has to fill only the fields (keywords) shown on white background color in the following tables. Keywords shown on gray background color are fixed or already selected by the user through the FPOSS utility or are fixed by the template itself.

Some keywords with fixed values will be overwritten during execution of the template by the sequencer script depending on other user-selected parameters.

For example the **OCS3.INS.LAMP** keyword in **FLAMES\_uves\_obs\_exp.tsf** may be:

“NOFIBRE”	if INS.UVES.SLIT equals 8FIB or 6FIB
“WLFIBRE1”	if INS.UVES.SLIT equals 7+1FIB and INS.PLATE equals 1
“WLFIBRE2”	if INS.UVES.SLIT equals 7+1FIB and INS.PLATE equals 2.

Instrument keywords have always a prefix identifying the sub-system involved: **OCS1** corresponds to the Fiber Positioner, **OCS2** is to the GIRAFFE, and **OCS3** to the UVES subsystem.

Note that for the Acquisition Templates not all keywords contained in the FPOSS target setup file are not reported in Tables A1, A2 and A3 as the file generated for e.g. the Medusa mode may contain several hundred of keywords depending on the number of assigned fibres.

Parameters read from the FPOSS target setup file are grouped in keywords selecting:

- 1) **Instrument Guide Star** and **Instrument Potential Guide Stars**;
- 2) **FACBs - Allocated Reference Stars** (and related total Fibre number)
- 3) **Allocated Fibres** for **GIRAFFE**, **UVES** and **ARGUS sky** (and related total Fibre number).

**FLAMES\_uves\_acq.tsf**

<i>To be specified:</i>		
Keyword	Range	Label in P2PP
<b>OCS1.INS.TARG.SETUP</b>	*.ins	FPOSS target setup file
<b>TEL.UVES.WLEN</b>	520 580 860	Config. wavelength
<i>Fixed values:</i>		
Keyword	Value	Label (not seen in P2PP)
<b>OCS1.INS.ADC.USED</b>	F	FP Argus ADC used flag
<b>OCS1.INS.CFGTIM</b>	AUTO	Configuration time flag
<b>OCS1.INS.PCC.AMBI.TEMP</b>	AUTO	ASM param. flag: temperature
<b>OCS1.INS.PCC.AMBI.PRES</b>	AUTO	ASM param. flag: atmospheric pressure
<b>OCS1.INS.PCC.AMBI.RHUM</b>	AUTO	ASM param. flag: relative humidity
<b>SEQ.PRESET</b>	T	Preset flag
<b>TEL.TARG.TYPE</b>	COORDINATE	type definition
<i>Parameters read from FPOSS: (Target Setup File from FP)</i>		
Keyword	Value	Label
<b>TEL.TARG.RA</b>	Ra()	RA of the Field Center
<b>TEL.TARG.DEC</b>	Dec()	DEC of the Field Center
<b>TEL.TARG.EQUINOX</b>	2000	Equinox of Ra/Dec
<b>INS.MODE</b>	UVES	Instrument mode
<b>INS.UVES.SLIT</b>	8FIB 7+1FIB 6FIB	Uves slit mode
<i>Parameters calculated by P2PP:</i>		
Keyword	Value	Label
<b>OCS1.INS.TIME</b>	1 .. 36000	OB total execution time

Table A1

**FLAMES\_giraf\_acq.tsf**

*To be specified:*

Keyword	Range	Label in P2PP
<b>OCS1.INS.TARG.SETUP</b>	*.ins	FPOSS target setup file
<b>TEL.GIRAFFE.WLEN</b>	L385.7 L427.2 L479.7 L543.1 L614.2 L682.2 L773.4 L881.7 H379.0 H395.8 H412.4 H429.7 H447.1A H447.1B H465.6 H484.5A H484.5B H504.8 H525.8A H525.8B H548.8 H572.8 H599.3 H627.3 H651.5A H651.5B H665.0 H679.7 H710.5 H737.0A H737.0B H769.1 H805.3A H805.3B, H836.6 H875.7 H920.5A H920.5B	Config. wavelength

*Fixed values:*

Keyword	Value	Label (not seen in P2PP)
<b>OCS1.INS.ADC.USED</b>	F	FP Argus ADC used flag
<b>OCS1.INS.CFGTIM</b>	AUTO	Configuration time flag
<b>OCS1.INS.PCC.AMBI.TEMP</b>	AUTO	ASM param. flag: temperature
<b>OCS1.INS.PCC.AMBI.PRES</b>	AUTO	ASM param. flag: atmospheric pressure
<b>OCS1.INS.PCC.AMBLRHUM</b>	AUTO	ASM param. flag: relative humidity
<b>SEQ.PRESET</b>	T	Preset flag
<b>TEL.TARG.TYPE</b>	COORDINATE	type definition

*Parameters read from FPOSS: (Target Setup File from FP)*

Keyword	Value	Label
<b>TEL.TARG.RA</b>	Ra()	RA of the Field Center
<b>TEL.TARG.DEC</b>	Dec()	DEC of the Field Center
<b>TEL.TARG.EQUINOX</b>	2000	Equinox of Ra/Dec
<b>INS.MODE</b>	GIRAF	Instrument mode
<b>INS.GIRAF.MODE</b>	MED IFU ARG	Giraffe mode

*Parameters calculated by P2PP:*

Keyword	Value	Label
<b>OCS1.INS.TIME</b>	1 .. 36000	OB total execution time

Table A2

**FLAMES\_com\_acq.tsf**

<i>To be specified:</i>		
Keyword	Range	Label in P2PP
<b>OCS1.INS.TARG.SETUP</b>	*.ins	FPOSS target setup file
<b>TEL.UVES.WLEN</b>	520 580 860	UVES config. wavelength
<b>TEL.GIRAFFE.WLEN</b>	L385.7 L427.2 L479.7 L543.1 L614.2 L682.2 L773.4 L881.7 H379.0 H395.8 H412.4 H429.7 H447.1A H447.1B H465.6 H484.5A H484.5B H504.8 H525.8A H525.8B H548.8 H572.8 H599.3 H627.3 H651.5A H651.5B H665.0 H679.7 H710.5 H737.0A H737.0B H769.1 H805.3A H805.3B H836.6A H836.6B H875.7 H920.5A H920.5B	GIRAFFE config. wavelength
<i>Fixed values:</i>		
Keyword	Value	Label (not seen in P2PP)
<b>OCS1.INS.ADC.USED</b>	F	FP Argus ADC used flag
<b>OCS1.INS.CFGTIM</b>	AUTO	Configuration time flag
<b>OCS1.INS.PCC.AMBI.TEMP</b>	AUTO	ASM param. flag: temperature
<b>OCS1.INS.PCC.AMBI.PRES</b>	AUTO	ASM param. flag: atmospheric pressure
<b>OCS1.INS.PCC.AMBI.RHUM</b>	AUTO	ASM param. flag: relative humidity
<b>SEQ.PRESET</b>	T	Preset flag
<b>TEL.TARG.TYPE</b>	COORDINATE	type definition
<i>Parameters read from FPOSS: (Target Setup File from FP)</i>		
Keyword	Value	Label
<b>TEL.TARG.RA</b>	Ra()	RA of the Field Center
<b>TEL.TARG.DEC</b>	Dec()	DEC of the Field Center
<b>TEL.TARG.EQUINOX</b>	2000	Equinox of Ra/Dec
<b>INS.MODE</b>	COM	Instrument mode
<b>INS.UVES.SLIT</b>	8FIB 7+1FIB 6FIB	Uves slit mode
<b>INS.GIRAF.MODE</b>	MED IFU ARG	Giraffe mode

<i>To be specified:</i>		
<i>Parameters calculated by P2PP:</i>		
<i>Keyword</i>	<i>Value</i>	<i>Label</i>
<b>OCS1.INS.TIME</b>	1 .. 36000	OB total execution time

Table A3

## FLAMES\_giraf\_acq\_argfast.tsf

<i>To be specified:</i>		
Keyword	Range	Label in P2PP
<b>TEL.TARG.ALPHA</b>	ra	Alpha coordinate for the target
<b>TEL.TARG.DELTA</b>	dec	Delta coordinate for the target
<b>TEL.TARG.EQUINOX</b>		Equinox
<b>TEL.TARG.ADDVELALPHA</b>	-15 .. 15	Alpha additional tracking velocity
<b>TEL.TARG.ADDVELDELTA</b>	-15 .. 15	Delta additional tracking velocity
<b>TEL.TARG.EPOCH</b>	-2000 .. 3000	Epoch
<b>TEL.TARG.PMA</b>	-10 .. 10	Proper motion in RA in arcsec/year
<b>TEL.TARG.PMD</b>	-10 .. 10	Proper motion in DEC in arcsec/year
<b>TEL.AG.GUIDESTAR</b>	CATALOGUE    SETUPFILE NONE	Get Guide Star from
<b>TEL.GS1.ALPHA</b>	ra	Guide star alpha
<b>TEL.GS1.DELTA</b>	dec	Guide star delta
<b>TEL.GIRAFFE.WLEN</b>	L385.7 L427.2 L479.7 L543.1 L614.2 L682.2 L773.4 L881.7  H379.0 H395.8 H412.4 H429.7 H447.1A H447.1B H465.6 H484.5A H484.5B H504.8H525.8A H525.8B H548.8 H572.8 H599.3 H627.3 H651.5A H651.5B H665.0 H679.7 H710.5H737.0A H737.0B H769.1 H805.3A H805.3B H836.6A H836.6B H875.7 H920.5A H920.5B	Config. Wavelength
<b>INS.ARGS.POSANG</b>	0 .. 360	Argus Position Angle
<b>INS.ARGS.SCALE</b>	1:1 1:1.67	Argus Scale
<b>INS.SKY.PARKED</b>	T F	Argus Sky fibres parked
<b>INS.SKY.RADIUS</b>	0.5 .. 12.5	Argus Sky fibre Radius
<i>Fixed values:</i>		
Keyword	Value	Label (not seen in P2PP)
<b>OCS1.INS.ADC.USED</b>	F	FP Argus ADC used flag

*To be specified:*

<b>INS.MODE</b>	GIRAF	Instrument mode
<b>INS.GIRAF.MODE</b>	ARG	Giraffe mode
<b>INS.ARGS.USED</b>	T	Argus Used
<b>SEQ.PRESET</b>	T	Preset flag
<b>TEL.TARG.TYPE</b>	COORDINATE	type definition

Table A4

**FLAMES\_uves\_obs\_exp.tsf**

<i>To be specified:</i>		
Keyword	Range	Label in P2PP
<b>OCS3.INS.GRAT2.WLEN</b>	520 580 860	Central wavelength
<b>OCS3.DET2.WIN1.UIT1</b>	0 .. 36000	Exposure time
<b>SEQ.NEXPO</b>	0 .. 30	No. of Exp.
<i>Fixed values:</i>		
Keyword	Value	Label (not seen in P2PP)
<b>DPR.CATG</b>	SCIENCE	Data product category
<b>DPR.TYPE</b>	OBJECT,OzPoz (if 8FIB or 6FIB)	Data product type
	OBJECT,SimCal (if 7+1FIB)	
<b>DPR.TECH</b>	MOS	Data product technique
<b>OCS3.INS.LAMP</b>	NOFIBRE (if 8FIB or 6FIB)	Calibration lamp
	WLFIBRE1 WLFIBRE2 (if 7+1FIB)	
<b>OCS3.INS.GRAT2.SETTINGS</b>	520 CD#3 SHP700 580 CD#3 SHP700 860 CD#4 OG590	Uves mode settings: [wavelength grating filter]
<b>OCS3.DET2.EXP.TYPE</b>	Normal	Exposure type

Table A5

**FLAMES\_giraf\_obs\_exp.tsf**

<i>To be specified:</i>		
Keyword	Range	Label in P2PP
<b>OCS2.INS.GRAT.WLEN</b>	L385.7 L427.2 L479.7 L543.1 L614.2 L682.2 L773.4 L881.7 H379.0 H395.8 H412.4 H429.7 H447.1A H447.1B H465.6 H484.5A H484.5B H504.8 H525.8 A H525.8B H548.8 H572.8 H599.3 H627.3 H651.5A H651.5B H665.0 H679.7 H710.5 H737.0A H737.0B H769.1 H805.3A H805.3B H836.6A H836.6B H875.7 H920.5A H920.5B	Central wavelength
<b>OCS2.INS.SIMFLAG</b>	ON OFF	Simultaneous Th-Ar calib. lamp
<b>OCS2.DET1.WIN1.UIT1</b>	0 .. 36000	Exposure time
<b>SEQ.NEXPO</b>	0 .. 30	No. of Exp.
<i>Fixed values:</i>		
Keyword	Value	Label (not seen in P2PP)
<b>DPR.CATG</b>	SCIENCE	Data product category
<b>DPR.TYPE</b>	OBJECT	Data product type
<b>DPR.TECH</b>	MOS (if Medusa mode)  IFU (if Ifu or Argus modes)	Data product technique
<b>OCS2.INS.SIMLAMP</b>	TAL	Simultaneous calib. lamp type
<b>OCS2.INS.SLITLAMP</b>	NONE	Lamp selection for the single slit calibration unit
<b>OCS2.INS.REFOCUS</b>	T	Refocus flag
<b>OCS2.DET1.EXP.TYPE</b>	Normal	Exposure type

Table A6

## FLAMES\_com\_obs\_exp.tsf

<i>To be specified:</i>		
Keyword	Range	Label in P2PP
<b>OCS2.INS.GRAT.WLEN</b>	L385.7 L427.2 L479.7 L543.1 L614.2 L682.2 L773.4 L881.7 H379.0 H395.8 H412.4 H429.7 H447.1A H447.1B H465.6 H484.5A H484.5B H504.8 H525.8A H525.8B H548.8 H572.8 H599.3 H627.3 H651.5A H651.5B H665.0 H679.7 H710.5 H737.0A H737.0B H769.1 H805.3A H805.3B H836.6A H836.6B H875.7 H920.5A H920.5B	GIRAFFE central wavelength
<b>OCS2.INS.SIMFLAG</b>	ON OFF	GIRAFFE simultaneous Th-Ar calib. lamp
<b>OCS2.DET1.WIN1.UIT1</b>	0 .. 36000	GIRAFFE exposure time
<b>SEQ.NEXPOGIR</b>	0 .. 30	GIRAFFE No. of Exp.
<b>OCS3.INS.GRAT2.WLEN</b>	520 580 860	UVES central wavelength
<b>OCS3.DET2.WIN1.UIT1</b>	0 .. 36000	UVES exposure time
<b>SEQ.NEXPOUVE</b>	0 .. 30	UVES No. of Exp.
<i>Fixed values:</i>		
Keyword	Value	Label (not seen in P2PP)
<b>DPR.CATG</b>	SCIENCE	Data product category
<b>DPR.TYPE</b>	OBJECT	Data product type
<b>DPR.TECH</b>	for Uves branch: MOS for Giraffe branch: MOS (if Medusa sub-mode) IFU (if Ifu or Argus sub-modes)	Data product technique
<b>OCS2.INS.REFOCUS</b>	T	Refocus flag (Giraffe)
<b>OCS2.DET1.EXP.TYPE</b>	Normal	Exposure type (Giraffe)
<b>OCS2.INS.SIMLAMP</b>	TAL	GIRAFFE simultaneous calib. lamp type
<b>OCS2.INS.SLITLAMP</b>	NONE	Lamp selection for the single slit calibration unit (Giraffe)
<b>OCS3.INS.LAMP</b>	NOFIBRE (if 8FIB or 6FIB) WLFIBRE1 (if 7+1FIB) WLFIBRE2 (if 7+1FIB)	Calibration lamp (Uves)

*To be specified:*

<b>OCS3.INS.GRAT2.SETTINGS</b>	520 CD#3 SHP700 580 CD#3 SHP700 860 CD#4 OG590	Uves mode settings: [wavelength grating filter]
<b>OCS3.DET2.EXP.TYPE</b>	Normal	Exposure type (Uves)

Table A7

**FLAMES\_giraf\_obs\_argoff.tsf**

<i>To be specified:</i>		
Keyword	Range	Label in P2PP
<b>OCS2.INS.GRAT.WLEN</b>	L385.7 L427.2 L479.7 L543.1 L614.2 L682.2 L773.4 L881.7 H379.0 H395.8 H412.4 H429.7 H447.1A H447.1B H465.6 H484.5A H484.5B H504.8 H525.8 A H525.5B H548.8 H572.8 H599.3 H627.3 H651.5A H651.5B H665.0 H679.7 H710.5 H737.0A H737.0B H769.1 H805.3A H805.3B H836.6A H836.6B H875.7 H920.5A H920.5B	Central wavelength
<b>OCS2.INS.SIMFLAG</b>	ON OFF	Simultaneous Th-Ar calib. lamp
<b>OCS2.DET1.WIN1.UIT1</b>	0 .. 36000	Exposure time
<b>SEQ.NEXPO</b>	0 .. 30	No. of Exp.
<b>SEQ.NOFF</b>	0 .. 100	No. of Offsets.
<b>TEL.TARG.OFFSETALPHA</b>	-999 .. 999	RA offsets in arcsec (list)
<b>TEL.TARG.OFFSETDELTA</b>	-999 .. 999	DEC offsets in arcsec (list)
<i>Fixed values:</i>		
Keyword	Value	Label (not seen in P2PP)
<b>DPR.CATG</b>	SCIENCE	Data product category
<b>DPR.TYPE</b>	OBJECT	Data product type
<b>DPR.TECH</b>	MOS (if Medusa mode)	Data product technique
	IFU (if Ifu or Argus modes)	
<b>OCS2.INS.SIMLAMP</b>	TAL	Simultaneous calib. lamp type
<b>OCS2.INS.SLITLAMP</b>	NONE	Lamp selection for the single slit calibration unit
<b>OCS2.INS.REFOCUS</b>	T	Refocus flag
<b>OCS2.DET1.EXP.TYPE</b>	Normal	Exposure type

Table A8

**FLAMES\_giraf\_obs\_argstd.tsf**

<i>To be specified:</i>		
Keyword	Range	Label in P2PP
<b>OCS2.INS.GRAT.WLEN</b>	L385.7 L427.2 L479.7 L543.1 L614.2 L682.2 L773.4 L881.7 H379.0 H395.8 H412.4 H429.7 H447.1A H447.1B H465.6 H484.5A H484.5B H504.8 H525.8A H525.8B H548.8 H572.8 H599.3 H627.3 H651.5A H651.5B H665.0 H679.7 H710.5 H737.0A H737.0B H769.1 H805.3A H805.3B H836.6A H836.6B H875.7 H920.5A H920.5B	Central wavelength
<b>OCS2.INS.SIMFLAG</b>	ON OFF	Simultaneous Th-Ar calib. lamp
<b>OCS2.DET1.WIN1.UIT1</b>	0 .. 36000	Exposure time
<b>SEQ.NEXPO</b>	0 .. 30	No. of Exp.
<b>SEQ.NOFF</b>	0 .. 100	No. of Offsets.
<b>TEL.TARG.OFFSETALPHA</b>	-999 .. 999	RA offsets in arcsec (list)
<b>TEL.TARG.OFFSETDELTA</b>	-999 .. 999	DEC offsets in arcsec (list)
<i>Fixed values:</i>		
Keyword	Value	Label (not seen in P2PP)
<b>DPR.CATG</b>	CALIB	Data product category
<b>DPR.TYPE</b>	STD	Data product type
<b>DPR.TECH</b>	IFU (if Ifu or Argus modes)	Data product technique
<b>OCS2.INS.SIMLAMP</b>	TAL	Simultaneous calib. lamp type
<b>OCS2.INS.SLITLAMP</b>	NONE	Lamp selection for the single slit calibration unit
<b>OCS2.INS.REFOCUS</b>	T	Refocus flag
<b>OCS2.DET1.EXP.TYPE</b>	Normal	Exposure type

Table A9

**FLAMES\_giraf\_obs\_ifustd.tsf**

<i>To be specified:</i>		
Keyword	Range	Label in P2PP
<b>OCS2.INS.GRAT.WLEN</b>	L385.7 L427.2 L479.7 L543.1 L614.2 L682.2 L773.4 L881.7 H379.0 H395.8 H412.4 H429.7 H447.1A H447.1B H465.6 H484.5A H484.5B H504.8 H525.8A H525.8B H548.8 H572.8 H599.3 H627.3 H651.5A H651.5B H665.0 H679.7 H710.5 H737.0A H737.0B H769.1 H805.3A H805.3B H836.6A H836.6B H875.7 H920.5A H920.5B	Central wavelength
<b>OCS2.INS.SIMFLAG</b>	ON OFF	Simultaneous Th-Ar calib. lamp
<b>OCS2.DET1.WIN1.UIT1</b>	0 .. 36000	Exposure time
<b>SEQ.NEXPO</b>	0 .. 30	No. of Exp.
<b>SEQ.NOFF</b>	0 .. 100	No. of Offsets.
<b>TEL.TARG.OFFSETALPHA</b>	-999 .. 999	RA offsets in arcsec (list)
<b>TEL.TARG.OFFSETDELTA</b>	-999 .. 999	DEC offsets in arcsec (list)
<i>Fixed values:</i>		
Keyword	Value	Label (not seen in P2PP)
<b>DPR.CATG</b>	CALIB	Data product category
<b>DPR.TYPE</b>	STD	Data product type
<b>DPR.TECH</b>	IFU (if Ifu or Argus modes)	Data product technique
<b>OCS2.INS.SIMLAMP</b>	TAL	Simultaneous calib. lamp type
<b>OCS2.INS.SLITLAMP</b>	NONE	Lamp selection for the single slit calibration unit
<b>OCS2.INS.REFOCUS</b>	T	Refocus flag
<b>OCS2.DET1.EXP.TYPE</b>	Normal	Exposure type

Table A10

**FLAMES\_uves\_cal\_flatatt.tsf**

<i>To be specified:</i>		
Keyword	Range	Label in P2PP
<b>SEQ.NEXPOUVE</b>	0 .. 30	No. of Exp.
<i>Fixed values:</i>		
Keyword	Value	Label (not seen in P2PP)
<b>DPR.CATG</b>	CALIB	Data product category
<b>DPR.TYPE</b>	LAMP,FLAT,ATTACH	Data product type
<b>DPR.TECH</b>	MOS	Data product technique
<b>OCS3.DET2.EXP.TYPE</b>	Normal	Exposure type
<b>OCS3.DET2.WIN1.UIT1</b>	coded value	Exposure time (Uves)

Table A11

**FLAMES\_giraf\_cal\_flatatt.tsf**

<i>To be specified:</i>		
Keyword	Range	Label in P2PP
<b>SEQ.NEXPOGIR</b>	0 .. 30	No. of Exp.
<i>Fixed values:</i>		
Keyword	Value	Label (not seen in P2PP)
<b>DPR.CATG</b>	CALIB	Data product category
<b>DPR.TYPE</b>	LAMP,FLAT	Data product type
<b>DPR.TECH</b>	MOS (if Medusa mode)	Data product technique
	IFU (if Ifu or Argus modes)	
<b>OCS2.DET1.EXP.TYPE</b>	Normal	Exposure type
<b>OCS2.INS.REFOCUS</b>	T	Refocus flag
<b>OCS2.DET1.WIN1.UIT1</b>	coded value	Exposure time (Giraffe)

Table A12



**FLAMES\_com\_cal\_flatatt.tsf**

<i>To be specified:</i>		
Keyword	Range	Label in P2PP
<b>SEQ.NEXPOGIR</b>	0 .. 30	GIRAFFE No. of Exp.
<b>SEQ.NEXPOUVE</b>	0 .. 30	UVES No. of Exp.
<i>Fixed values:</i>		
Keyword	Value	Label (not seen in P2PP)
<b>DPR.CATG</b>	CALIB	Data product category
<b>DPR.TYPE</b>	for <u>Uves branch</u> : LAMP,FLAT,NASMYTH  for <u>Giraffe branch</u> : LAMP,FLAT	Data product type
<b>DPR.TECH</b>	for <u>Uves branch</u> : MOS  for <u>Giraffe branch</u> : MOS (if Medusa mode) IFU (if Ifu or Argus modes)	Data product technique
<b>OCS2.DET1.EXP.TYPE</b>	Normal	Exposure type (Giraffe)
<b>OCS2.INS.REFOCUS</b>	T	Refocus flag (Giraffe)
<b>OCS2.DET1.WIN1.UIT1</b>	coded value	Exposure time (Giraffe)
<b>OCS3.DET2.EXP.TYPE</b>	Normal	Exposure type (Uves)
<b>OCS3.DET2.WIN1.UIT1</b>	coded value	Exposure time (Uves)

Table A13

**B. FLAMES Template Signature Files: calibration and technical**

In the following Tables all calibration and technical FLAMES TSFs are listed with their free and fixed parameters. These Templates are intended to be used only by the Paranal Operations Team.

<b>FLAMES_gira_tec_expfree.tsf</b>
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<i>To be specified:</i>		
Keyword	Range	Label in P2PP
<b>OCS2.DET1.WIN1.UIT1</b>	0 .. 36000	Exposure time
<b>SEQ.NEXPO</b>	0 .. 30	No. of Exp.
<b>OCS2.INS.GRAT.NAME</b>	HR LR	Grating name
<b>OCS2.INS.GRAT.WLEN</b>	365 .. 950	Central wavelength
<b>OCS2.INS.GRAT.ORDER</b>	2 .. 15	Grating order
<b>OCS2.DET1.WIN1.BINX</b>	1 .. 2	Binning mode along X
<b>OCS2.INS.FILT.NAME</b>	LR1 LR2 LR3 LR4 LR5 LR6 LR7 LR8 HR1 HR2 HR3 HR4 HR5 HR6 HR7 HR8 HR9 HR10 HR11 HR12 HR13 HR14 HR15 HR16 HR17 HR18 HR19 HR20 HR21 HR22	Filter name
<b>OCS2.INS.SLITLAMP</b>	NONE HAL TAL NEL FFL	Lamp for single slit calibration unit
<b>OCS2.INS.SLIT.NAME</b>	Medusa1 Medusa2 IFU1 IFU2 ARGUS LongSlit	Slit / Plate selection
<b>OCS2.INS.SIMLAMP</b>	NONE HAL TAL NEL	Lamp for simultaneous calibration box unit
<i>Fixed values:</i>		
Keyword	Value	Label (not seen in P2PP)
<b>DPR.CATG</b>	SCIENCE	Data product category
<b>DPR.TYPE</b>	OBJECT	Data product type
<b>DPR.TECH</b>	MOS (if Medusa mode) IFU (if Ifu or Argus modes)	Data product technique
<b>OCS2.INS.REFOCUS</b>	T	Refocus flag (Giraffe)
<b>OCS2.DET1.EXP.TYPE</b>	Normal	Exposure type (Giraffe)

Table B1



<b>FLAMES_uves_cal_dark.tsf</b>
---------------------------------

<i>To be specified:</i>		
Keyword	Range	Label in P2PP
<b>OCS3.DET2.WIN1.UIT1</b>	0 .. 36000	Exposure time
<b>SEQ.NEXPO</b>	0 .. 30	No. of Exp.
<i>Fixed values:</i>		
Keyword	Value	Label (not seen in P2PP)
<b>DPR.CATG</b>	CALIB	Data product category
<b>DPR.TYPE</b>	DARK	Data product type
<b>DPR.TECH</b>	IMAGE	Data product technique
<b>INS.MODE</b>	UVESCAL	Instrument mode
<b>OCS3.DET2.EXP.TYPE</b>	Dark	Exposure type

Table B2

<b>FLAMES_uves_cal_bias.tsf</b>
---------------------------------

<i>To be specified:</i>		
Keyword	Range	Label in P2PP
<b>SEQ.NEXPO</b>	0 .. 30	No. of Exp.
<i>Fixed values:</i>		
Keyword	Value	Label (not seen in P2PP)
<b>DPR.CATG</b>	CALIB	Data product category
<b>DPR.TYPE</b>	BIAS	Data product type
<b>DPR.TECH</b>	IMAGE	Data product technique
<b>OCS3.DET2.WIN1.UIT1</b>	0	Uves exposure time (sec)

<i>To be specified:</i>		
<b>INS.MODE</b>	UVESCAL	Instrument mode
<b>OCS3.DET2.EXP.TYPE</b>	Dark	Exposure type

Table B3

**FLAMES\_giraf\_cal\_dark.tsf**

<i>To be specified:</i>		
Keyword	Range	Label in P2PP
<b>OCS2.DET1.WIN1.UIT1</b>	0 .. 36000	Exposure time
<b>SEQ.NEXPO</b>	0 .. 30	No. of Exp.
<i>Fixed values:</i>		
Keyword	Value	Label (not seen in P2PP)
<b>DPR.CATG</b>	CALIB	Data product category
<b>DPR.TYPE</b>	DARK	Data product type
<b>DPR.TECH</b>	IMAGE	Data product technique
<b>INS.MODE</b>	GIRCAL	Instrument mode
<b>OCS2.DET1.EXP.TYPE</b>	Dark	Exposure type
<b>OCS2.INS.REFOCUS</b>	F	Refocus flag

Table B4

**FLAMES\_giraf\_cal\_bias.tsf**

<i>To be specified:</i>		
Keyword	Range	Label in P2PP
<b>SEQ.NEXPO</b>	0 .. 30	No. of Exp.
<i>Fixed values:</i>		
Keyword	Value	Label (not seen in P2PP)
<b>DPR.CATG</b>	CALIB	Data product category
<b>DPR.TYPE</b>	BIAS	Data product type
<b>DPR.TECH</b>	IMAGE	Data product technique
<b>INS.MODE</b>	GIRCAL	Instrument mode
<b>OCS2.DET1.WIN1.UIT1</b>	0	Giraffe exposure time (sec)
<b>OCS2.DET1.EXP.TYPE</b>	Dark	Exposure type
<b>OCS2.INS.REFOCUS</b>	F	Refocus flag

Table B5

<b>FLAMES_uves_cal_flat.tsf</b>
---------------------------------

*To be specified:*

Keyword	Range	Label in P2PP
<b>INS.UVES.SLIT</b>	8FIB 7+1FIB 6FIB	Uves slit mode
<b>SEQ.NEXPO</b>	0 .. 30	No. of Exp.
<b>OCS3.INS.GRAT2.WLEN</b>	520 580 860	Central wavelength
<b>OCS1.INS.PLATE</b>	1 2	Plate number
<b>OCS1.INS.CAL.TYPE</b>	ODD EVEN ALL ODD+EVEN+ALL	Uves calibration Type
<b>OCS1.INS.STARTR</b>	180000 ?	Spiral R at 0 deg (micron)
<b>OCS1.INS.STOPR</b>	170000 ?	Spiral R at 360 deg (micron)
<b>OCS1.INS.NUM</b>	1 .. 250	Number of sweeps over fibres
<b>OCS1.INS.PARK</b>	T F	Park UVES Fibres before configuration
<b>OCS1.INS.CONFIG</b>	T F	Configure fibres before calibration

*Fixed values:*

Keyword	Value	Label (not seen in P2PP)
<b>DPR.CATG</b>	CALIB	Data product category
<b>DPR.TYPE</b>	LAMP,FLAT,ODD,OzPoz LAMP,FLAT,EVEN,OzPoz LAMP,FLAT,ALL,OzPoz (if 8FIB or 6FIB)  LAMP,FLAT,ODD,SimCal LAMP,FLAT,EVEN,SimCal LAMP,FLAT,ALL,SimCal (if 7+1FIB)	Data product type
<b>DPR.TECH</b>	MOS	Data product technique
<b>OCS3.INS.GRAT2.SETTINGS</b>	520 CD#3 SHP700 580 CD#3 SHP700 860 CD#4 OG590	Uves mode settings: [wavelength grating filter]
<b>OCS3.DET2.EXP.TYPE</b>	Normal	Exposure type
<b>OCS1.INS.LAMP</b>	TUNGSTEN	FP calibration lamp type
<b>OCS1.INS.TIME</b>	0	Exposure time of each fibre (sec)

<i>To be specified:</i>		
<b>OCS1.INS.CONT</b>	SWEEP	Calibration method

Table B6

FLAMES_uves_cal_wave.tsf
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<i>To be specified:</i>		
Keyword	Range	Label in P2PP
<b>INS.UVES.SLIT</b>	8FIB 7+1FIB 6FIB	Uves slit mode
<b>SEQ.NEXPO</b>	0 .. 30	No. of Exp.
<b>OCS3.INS.GRAT2.WLEN</b>	520 580 860	Central wavelength
<b>OCS1.INS.PLATE</b>	1 2	Plate number
<b>OCS1.INS.CAL.TYPE</b>	ODD EVEN ALL ODD+EVEN+ALL	Uves calibration Type
<b>OCS1.INS.STARTR</b>	180000 ?	Spiral R at 0 deg (micron)
<b>OCS1.INS.STOPR</b>	170000 ?	Spiral R at 360 deg (micron)
<b>OCS1.INS.LAMP</b>	THORIUM NEON	FP calibration lamp type
<b>OCS1.INS.TIME</b>	0 .. 250	Exposure time of each fibre (sec)
<b>OCS1.INS.PARK</b>	T F	Park UVES fibres before configuration
<b>OCS1.INS.CONT</b>	SWEEP VISIT	Calibration method
<b>OCS1.INS.NUM</b>	1	Number of sweeps over fibres
<b>OCS1.INS.CONFIG</b>	T F	Configure fibres before calibration
<i>Fixed values:</i>		
Keyword	Value	Label (not seen in P2PP)
<b>DPR.CATG</b>	CALIB	Data product category

<i>To be specified:</i>		
<b>DPR.TYPE</b>	LAMP,WAVE,OzPoz (if 8FIB or 6FIB)	Data product type
	LAMP,WAVE,SimCal (if 7+1FIB)	
<b>DPR.TECH</b>	MOS	Data product technique
<b>OCS3.INS.GRAT2.SETTINGS</b>	520 CD#3 SHP700	Uves mode settings: [wavelength grating filter]
	580 CD#3 SHP700	
	860 CD#4 OG590	
<b>OCS3.DET2.EXP.TYPE</b>	Normal	Exposure type

Table B7

## FLAMES\_giraf\_cal\_flat.tsf

<i>To be specified:</i>		
Keyword	Range	Label in P2PP
<b>SEQ.NEXPO</b>	0 .. 30	Number of exposures
<b>OCS2.INS.GRAT.WLEN</b>	L385.7 L427.2 L479.7 L543.1 L614.2 L682.2 L773.4 L881.7 H379.0 H395.8 H412.4 H429.7 H447.1A H447.1B H465.6 H484.5A H484.5B H504.8 H525.8 A H525.8B H548.8 H572.8 H599.3 H627.3 H651.5A H651.5B H665.0 H679.7 H710.5 H737.0A H737.0B H769.1 H805.3A H805.3B H836.6A H838.6B H875.7 H920.5A H920.5B	Central wavelength
<b>OCS1.INS.STARTR</b>	180000 ?	Spiral R at 0 deg (micron)
<b>OCS1.INS.STOPR</b>	170000 ?	Spiral R at 360 deg (micron)
<b>OCS1.INS.FIBTYPE</b>	Medusa IFU	Fiber type - calibration mode
<b>OCS1.INS.NUM</b>	1 .. 250	Number of sweeps over fibres
<b>OCS1.INS.PLATE</b>	1 2	Plate number
<b>OCS1.INS.PARK</b>	T F	Park UVES fibres before configuration
<b>OCS1.INS.CONFIG</b>	T F	Configure fibres before calibration
<i>Fixed values:</i>		
Keyword	Value	Label (not seen in P2PP)
<b>DPR.CATG</b>	CALIB	Data product category
<b>DPR.TYPE</b>	LAMP,FLAT	Data product type
<b>DPR.TECH</b>	MOS	Data product technique
<b>INS.MODE</b>	GIRAF	Instrument mode
<b>OCS2.INS.SLITLAMP</b>	NONE	Lamp selection for the single slit calibration unit
<b>OCS2.INS.SIMLAMP</b>	HAL	Lamp selection for the simultaneous calibration box unit
<b>OCS2.INS.REFOCUS</b>	T	Refocus flag
<b>OCS2.DET1.EXP.TYPE</b>	Normal	Exposure type

<i>To be specified:</i>		
<b>OCS1.INS.LAMP</b>	TUNGSTEN	FP calibration lamp type
<b>OCS1.INS.TIME</b>	0	Exposure time of each fibre (sec)
<b>OCS1.INS.CONT</b>	SWEEP	Calibration method

Table B8

<b>FLAMES_giraf_cal_wave.tsf</b>
----------------------------------

*To be specified:*

Keyword	Range	Label in P2PP
<b>SEQ.NEXPO</b>	0 .. 30	Number of exposures
<b>OCS2.INS.GRAT.WLEN</b>	L385.7 L427.2 L479.7 L543.1 L614.2 L682.2 L773.4 L881.7 H379.0 H395.8 H412.4 H429.7 H447.1A H447.1B H465.6 H484.5A H484.5B H504.8 H525.8A H525.8B H548.8 H572.8 H599.3 H627.3 H651.5A H651.5B H665.0 H679.7 H710.5 H737.0A H737.0B H769.1 H805.3A H805.3B H836.6A H836.6B H875.7 H920.5A H920.5B	Central wavelength (nm)
<b>OCS1.INS.STARTR</b>	180000 ?	Spiral R at 0 deg (micron)
<b>OCS1.INS.STOPR</b>	170000 ?	Spiral R at 360 deg (micron)
<b>OCS1.INS.FIBTYPE</b>	Medusa IFU	Fiber type - calibration mode
<b>OCS1.INS.LAMP</b>	THORIUM NEON	FP calibration lamp type
<b>OCS1.INS.TIME</b>	0 .. 250	Exposure time of each fibre (sec)
<b>OCS2.INS.SIMLAMP</b>	TAL NEL	Lamp selection for the simultaneous calibration box unit
<b>OCS1.INS.PLATE</b>	1 2	Plate number
<b>OCS1.INS.PARK</b>	T F	Park UVES fibres before configuration
<b>OCS1.INS.NUM</b>	1 .. 250	Number of sweeps over fibres
<b>OCS1.INS.CONT</b>	SWEEP VISIT	Calibration method
<b>OCS1.INS.CONFIG</b>	T F	Configure fibres before calibration
<i>Fixed values:</i>		
Keyword	Value	Label (not seen in P2PP)
<b>DPR.CATG</b>	CALIB	Data product category
<b>DPR.TYPE</b>	LAMP,WAVE	Data product type
<b>DPR.TECH</b>	MOS	Data product technique
<b>INS.MODE</b>	GIRAF	Instrument mode

<i>To be specified:</i>		
<b>OCS2.INS.SLITLAMP</b>	NONE	Lamp selection for the single slit calibration unit
<b>OCS2.INS.REFOCUS</b>	T	Refocus flag
<b>OCS2.DET1.EXP.TYPE</b>	Normal	Exposure type

Table B9

**FLAMES\_uves\_tec\_fmtchk.tsf**

<i>To be specified:</i>		
Keyword	Range	Label in P2PP
<b>OCS3.DET2.WIN1.UIT1</b>	0 .. 36000	Exposure time
<b>SEQ.NEXPO</b>	0 .. 30	No. of Exp.
<b>OCS3.INS.GRAT2.WLEN</b>	520 580 860	Central wavelength
<b>OCS3.INS.LAMP</b>	WLFIBRE1 WLFIBRE2	Calibration lamp slit
<i>Fixed values:</i>		
Keyword	Value	Label (not seen in P2PP)
<b>DPR.CATG</b>	CALIB	Data product category
<b>DPR.TYPE</b>	LAMP,FMTCHK,SimCal	Data product type
<b>DPR.TECH</b>	MOS	Data product technique
<b>INS.MODE</b>	UVESCAL	Instrument mode
<b>OCS3.DET2.EXP.TYPE</b>	Normal	Exposure type
<b>OCS3.INS.GRAT2.SETTINGS</b>	520 CD#3 SHP700 580 CD#3 SHP700 860 CD#4 OG590	Uves mode settings: [wavelength grating filter]

Table B10

**FLAMES\_uves\_tec\_orderdef.tsf**

<i>To be specified:</i>		
Keyword	Range	Label in P2PP
<b>OCS3.DET2.WIN1.UIT1</b>	0 .. 36000	Exposure time
<b>SEQ.NEXPO</b>	0 .. 30	No. of Exp.
<b>OCS3.INS.GRAT2.WLEN</b>	520 580 860	Central wavelength
<b>OCS3.INS.LAMP</b>	FFFIBRE1 FFFIBRE2	Calibration lamp slit
<i>Fixed values:</i>		
Keyword	Value	Label (not seen in P2PP)
<b>DPR.CATG</b>	CALIB	Data product category
<b>DPR.TYPE</b>	LAMP,ORDERDEF,SimCal	Data product type

<i>To be specified:</i>		
<b>DPR.TECH</b>	MOS	Data product technique
<b>INS.MODE</b>	UVESCAL	Instrument mode
<b>OCS3.DET2.EXP.TYPE</b>	Normal	Exposure type
<b>OCS3.INS.GRAT2.SETTINGS</b>	520 CD#3 SHP700	Uves mode settings: [wavelength grating filter]
	580 CD#3 SHP700	
	860 CD#4 OG590	

Table B11

## FLAMES\_uves\_tec\_sflat.tsf

<i>To be specified:</i>		
Keyword	Range	Label in P2PP
<b>OCS3.DET2.WIN1.UIT1</b>	1 .. 36000	Exposure time
<b>SEQ.NEXPO</b>	1 .. 100	No. of Exp.
<b>SEQ.NOFF</b>	1 .. 100	Number of offsets
<b>OCS3.INS.LAMP</b>	FFL3 FFL4	Flat field calibration lamp
<b>OCS3.INS.SLIT3.WID</b>	0.15 .. 10.0	Slit width
<b>OCS3.INS.SLIT3.LEN</b>	0.2 .. 30.0	Decker Height
<b>OCS3.INS.SLIT3.OFFSETX</b>	-5 .. 5	Decker offsets in arcsec
<b>OCS3.INS.FILT3.NAME</b>	FREE BG40 SHP700 OG590 BK7_5 BK7_10 BK7_15	Filter
<b>OCS3.INS.GRAT2.NAME</b>	CD#3 CD#4	Cross disperser id.
<b>OCS3.INS.GRAT2.WLEN</b>	500.0 .. 1100.0	Cross disperser wavelength
<b>OCS3.INS.TIL2.POS</b>	-220.0 .. 220.0	Camera tilt
<b>OCS3.DET2.READ.SPEED</b>	225kHz,1x1,low 50kHz,2x2,high 225kHz,1x2,low 50kHz,2x3,high 625kHz,1x1,low	Readout mode
<i>Fixed values:</i>		
Keyword	Value	Label (not seen in P2PP)
<b>DPR.CATG</b>	CALIB	Data product category
<b>DPR.TYPE</b>	LAMP,FLAT	Data product type
<b>DPR.TECH</b>	ECHELLE	Data product technique
<b>OCS3.DET2.EXP.TYPE</b>	Normal	Exposure type

Table B12

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