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VLT INSTRUMENTATION

FLAMES TEMPLATES REFERENCE MANUAL

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Prepared	E. Rossetti	14/10/2002	.....
	Name	Date	Signature
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1. List of acronyms and abbreviations

AT	Acquisition Template
ARGUS	Giraffe Integral Field Spectroscopy mode
BOB	Broker of Observation Blocks
CCD	Charge−Coupled Device
CCS	Central Control Software
CT	Calibration Template
FACB	Field Acquisition Coherent Bundle
FFL	Flat Field Lamp
FLAMES	VLT Multi Object Fiber Facility
FP	Fiber Positioner
FPOSS	Fibre Positioner Observer Support Software
GIRAFFE	Spectrograph, part of Flames
IFU	Integral Field Unit
MEDUSA	Multi−Object Spectroscopy mode
MOS	VLT Multi−Object slit spectrograph
OB	Observation Block
OT	Observation Template
PAF	Parameter Format File
P2PP	Phase II Proposal Preparation
TANL	Th−Ar−Ne Lamp
TSF	Template Signature File
UVES	UV 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−?????, V ?.?

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

[6] FPOSS User Manual, INS−MAN−AUS−13721−0079, V 1.5

3. INTRODUCTION

This document describes the status of **FLAMES** (Fibre Large Array Multi Element Spectrograph) **Templates** after Commissioning 3 phase performed in Paranal at the end of August 2002.
It supersedes the reference [1] document.
The reader of this reference manual is assumed to be familiar with the FLAMES instrument (ref. [4]), with P2PP tool (ref. [2]) and with FPOSS Fibre configuration program (ref. [6]).

FLAMES Templates are characterized 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.

The TSFs we refer to in this document have been archived using CMM (the VLT Software Configuration Management Module) under the software modules *flotsf* (V 2.20) and *flmtsf* (V 1.10).

4. TEMPLATE NAMES

As a general rule (see ref. [3]) FLAMES TSFs are divided in groups according to the functions to be performed.
The name of a TSF has the following scheme:

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
(we used: *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).

Note that a few template names have been changed with respect to reference [1], for simplicity reasons.

4.1 TSF keywords

According to document [3] 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 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 main science modes:

1. **UVES** mode: light beam enters the UVES spectrograph (using only RED arm)
2. **GIRAFFE** mode: light beam enters the GIRAFFE spectrograph
3. **COMBINED** mode: ligth beam is shared between UVES and GIRAFFE spectrographs, allowing simultaneous observations.

In section 6 are listed the sub−modes usable for every main mode.

The following tables list templates available both for astronomers and for Paranal Science Operation team. For security reasons technical and calibration templates (excluded attached calibrations) are intended to be used and controlled only by the Paranal team.
Table 1 lists templates that will be supplied to the astronomers (as FLAMES *Instrument Package*) and then usable within the P2PP utility.

Type	Name
ACQUISITION TEMPLATES	**FLAMES_uves_acq** **FLAMES_giraf_acq** **FLAMES_com_acq**
OBSERVATION TEMPLATES	**FLAMES_uves_obs_exp** **FLAMES_giraf_obs_exp** **FLAMES_com_obs_exp**
CALIBRATION TEMPLATES	**FLAMES_uves_cal_flatatt** **FLAMES_giraf_cal_flatatt** **FLAMES_com_cal_flatatt**

Table 1 − Template to be used by astronomers

Table 2 lists TSFs that are available but not intended to be used by the astronomers. These templates will be used either during the testing phase or for calibration purpose by the Paranal team.

According to reference [3] all these TSFs need also and use **FLAMES.isf** (i.e. the so called Instrument Summary File). This file is a complement of TSFs and provides instrument−specific information mainly the list and range of values for particular keywords.

Type	Name
OBSERVATION TEMPLATES	**FLAMES_freegira_obs_exp**
CALIBRATION TEMPLATES	**FLAMES_uves_cal_dark** **FLAMES_uves_cal_bias** **FLAMES_uves_cal_flat** **FLAMES_uves_cal_wave** **FLAMES_uves_tec_fmtchk** **FLAMES_uves_tec_orderdef** **FLAMES_uves_tec_sflat** **FLAMES_giraf_cal_dark** **FLAMES_giraf_cal_bias** **FLAMES_giraf_cal_flat** **FLAMES_giraf_cal_wave**

Table 2 − Template to be used by Paranal team

6. ACQUISITION TEMPLATES

As reported in Table 1, FLAMES acquistion templates are only 3: one acquisition template for every instrument mode (see sect. 6.1, 6.2 and 6.3).
The fiber combination (see Table 3) is set by the astronomer at FPOSS level (Fiber Positioner Observer Support Software, ref. [6]), and saved in Parameter Format File (PAF).

For all acquisition templates, at P2PP level, the user has to select the so called PAF file. This is the Target Setup File from FP (i.e. the file saved by the user at the end of FPOSS phase for a given planned observation; it contains the target, guide stars, observing mode, fiducial stars fibre and guide probe assignation).

		Keywords used in PAF file		
Instrument Mode	*Instrument Sub−Mode* (fibre combination)	*INS.MODE* (FLAMES main mode)	*INS.GIRAF.MODE* (Giraffe mode)	*INS.UVES.SLIT* (Uves slit mode)
UVES	**UVES8** (all 8 fibres)	**UVES**	**−**	**8FIB**
	UVES7 (7 fibres + calibration)	**UVES**	**−**	**7+1FIB**
	UVES6 (only 6 fibres for observations at 520 nm.)	**UVES**	**−**	**6FIB**
GIRAFFE	**MEDUSA**	**GIRAF**	**MED**	**−**
	IFU	**GIRAF**	**IFU**	**−**
	ARGUS	**GIRAF**	**ARG**	**−**
COMBINED	**MEDUSA + UVES**	**COM**	**MED**	**8FIB**
	IFU + UVES	**COM**	**IFU**	**8FIB**
	ARGUS + UVES	**COM**	**ARG**	**8FIB**
	MEDUSA + UVES7	**COM**	**MED**	**7+1FIB**
	IFU + UVES7	**COM**	**IFU**	**7+1FIB**
	ARGUS + UVES7	**COM**	**ARG**	**7+1FIB**

Table 3 − FLAMES modes and fibre combinations

According to FLAMES conventions the name of PAF file follows the scheme:

<FieldName>.<Mode>.<TimeStamp>.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 unicity of PAF file name. However, as further check, the parameters stored in PAF file will be visible, at P2PP level, when the user selects the PAF filename.
A small preview window will display the contents of the selected filename (Figure 2).

Presently available version of P2PP (V. 2.4) does not allow to compute automatically the whole observing time planned for a given FLAMES OB. For all acquisition templates this parameter must be provided by the user now, but in future it will not be requested because P2PP will compute it automatically.

6.1 FLAMES_uves_acq

This is the right template to be used when observing with UVES spectrograph alone. At P2PP level the user has to select these parameters:

1) Target Setup File from FP (*PAF file*)
2) Planned whole TIME for this OB (sec)
3) UVES configuring wavelength (nm).

UVES wavelength is needed to configure both **FP** Uves branch and telescope wavelength.

6.2 FLAMES_giraf_acq

This template provides instrumental setup for GIRAFFE spectrograph, when used alone. At P2PP level the astronomer will have to provide these parameters:

1) Target Setup File from FP (*PAF file*)
2) Planned whole TIME for this OB (sec)
3) GIRAFFE configuring wavelength (nm).

GIRAFFE wavelength is used to configure both **FP** Giraffe branch and telescope wavelength.

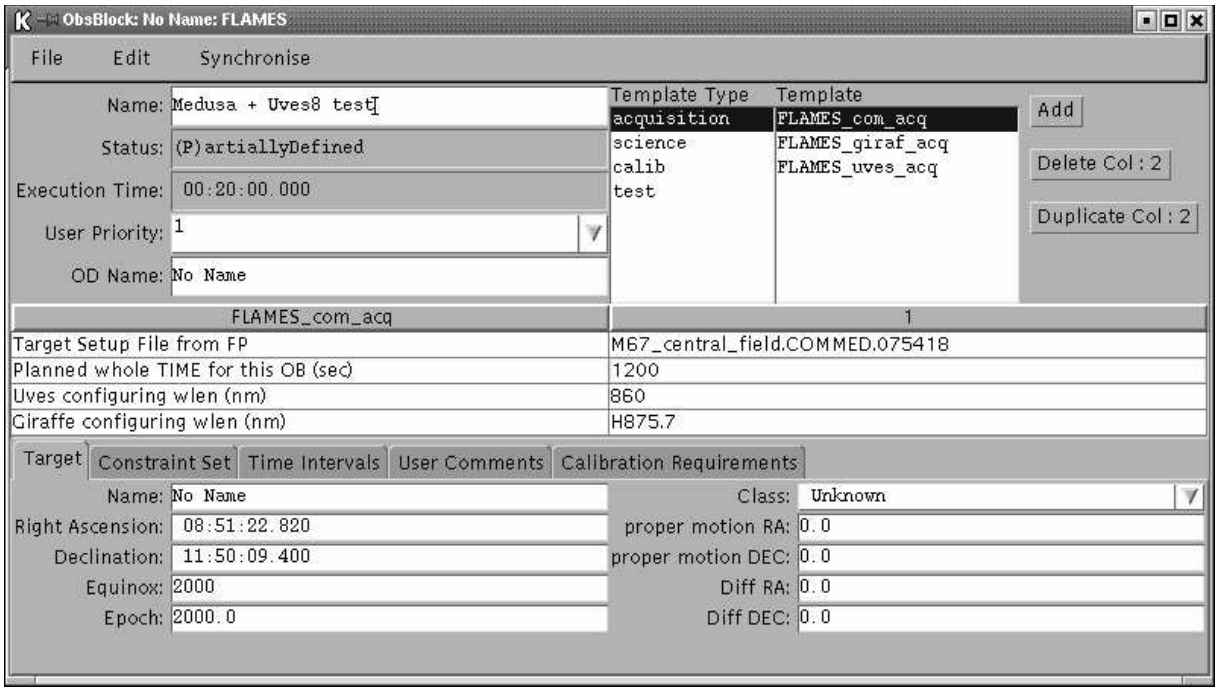

Figure 1 − FLAMES acquisition template: P2PP window

6.3 FLAMES_com_acq

This template must be used only for COMBINED mode. At P2PP level the user has to select the following parameters (as an example see Figure 1):

1) Target Setup File from FP
2) Planned whole TIME for this OB (sec)
3) Uves configuring wavelength (nm)
4) Giraffe configuring wavelength (nm).

In this particular case UVES configuration wavelength is used only to set the **FP** Uves branch, whilst GIRAFFE configuration wavelength is needed to configure both the **FP** Giraffe branch and telescope wavelength.

For FLAMES acquisition templates all configuration wavelengths must be selected by the user from a *combobox* reporting all Uves and/or Giraffe (high/low resolution) wavelength lists.

Please notice that, in order to avoid instrumental mismatches, these wavelengths **should** be the same as the one selected in the Observation Template.

To observe in Argus mode it is mandatory to choose the offset of the rotator and the lenses mode (allowing different scales onto the ARGUS microlenses array). The keywords related to these two parameters are not chosen at P2PP level: the astronomer will have to select them by using FPOSS utility (see ref.[6]).

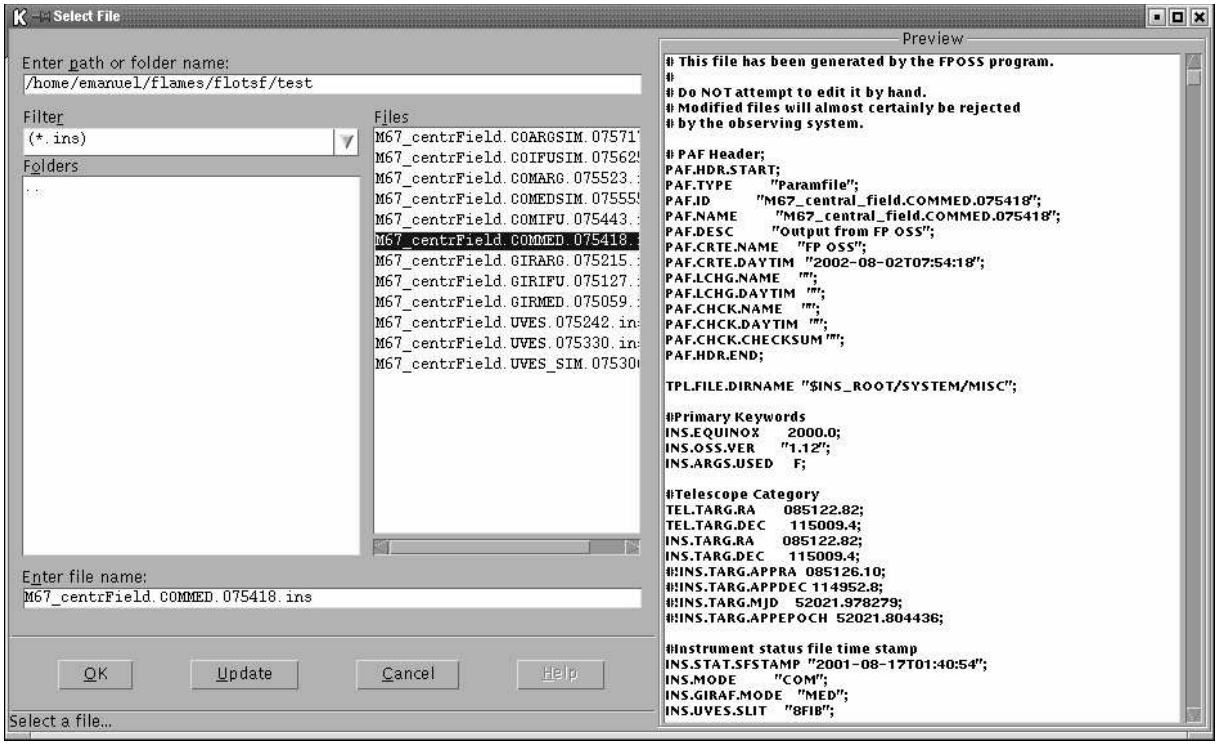

Figure 2 − P2PP preview window to look at FLAMES PAF file

7. OBSERVATION TEMPLATES

Observation templates contain all the information necessary to carry out an observation sequence with a specified instrumental setup.
As reported in Table 1, Observation Templates are only 3: one for every instrument mode. In this way there is only one template when observing, for example, with Giraffe: within the same template the astronomer can select either the high resolution grating or the low resolution one. Also the combined observing mode is achieved with a single template.
In all these templates the user, at P2PP level, has to select the instrument exposure time, number of exposures and the grating setup. This setup must match the telescope selected wavelength.

7.1 FLAMES_uves_obs_exp

The astronomer can use only the red arm of UVES spectrograph and choose one of the three predefined wavelength standard settings:

520, **580**, **860** nm.

No other instrumental configurations (like cross disperser number and filter name) have to be selected since these are fixed for each setting and are automatically provided by the template.

7.2 FLAMES_giraf_obs_exp

As already mentioned only one observation template is available for GIRAFFE. At P2PP level by *clicking* directly on the *combobox* (labeled as "Giraffe central wavelength) the gratings (Low or High) and related wavelengths (in nm.) can be selected (Figure 3). They are:

L385.7, **L427.2**, **L479.7**, **L543.1**, **L614.2**,
L682.2, **L773.4**, **L881.7**, **H379.0**, **H395.8**,
H412.4, **H429.7**, **H447.1**, **H465.6**, **H484.5**,
H504.8, **H525.8**, **H548.8**, **H572.8**, **H599.3**,
H627.3, **H651.5**, **H679.7**, **H710.5**, **H737.0**,
H769.1, **H805.3**, **H836.6**, **H875.7**, **H920.5** .

The keyword **INS.GRAT.NAME** (see ref. [1]) is not used inside the TSF but is selected at *script* level depending on the wavelength chosen by the user.

7.3 FLAMES_com_obs_exp

This template must be used to perform observations in combined mode. It derives from the union of the two templates described in sections 7.1 and 7.2.
It has therefore 6 input parameters:

1. central wavelength setup for GIRAFFE
2. exposure time for GIRAFFE
3. number of exposure for GIRAFFE
4. central wavelength setup for UVES
5. exposure time for UVES
6. number of exposures for UVES

Note that for UVES and GIRAFFE, exposure times and number of exposures will not generally be the same (and even if they were the same the related keywords are different). So the user will have to input these values twice.

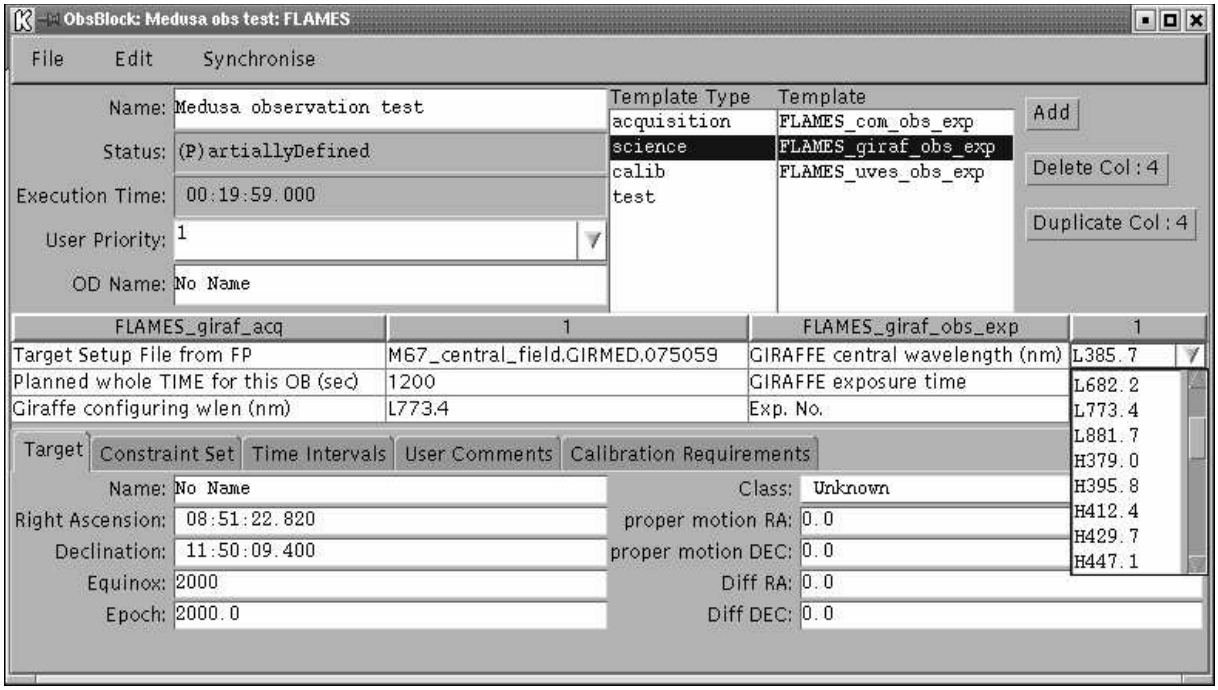

Figure 3 − FLAMES: AT and OT with an opened *combobox* for wavelengths

7.4 FLAMES_freegira_obs_exp (not for Astronomers)

The use of this Giraffe TSF is not allowed to the astronomers. The purpose of this template is to allow a *free* instrument setting during the FLAMES test phases.
The use of this template requires a very experienced user, since no check is done on the consistency of the parameters chosen.
See Table B1 for a full list of free keywords to be selected by the user.

For all Observation Templates caution is recommended in choosing the right one. Since a science OB must be composed of templates belonging to the same mode, the user has to check if the selected observation template is compatible with the acquisition templates previously selected. The user is strongly recommended to check the INS.MODE keyword written in the PAF file.

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 astronomer will not have to prepare any calibration OB. Calibrations will be provided by Paranal Science Operation team, following the FLAMES Calibration Plan.

Calibration templates may be grouped in: *attached* calibration, detector calibration, *Stand−alone* calibration and technical calibration.

8.1 Attached calibration

These templates have been devised in order to perform *flat−field* calibration during the night. They are:

FLAMES_uves_cal_flatatt
FLAMES_giraf_cal_flatatt
FLAMES_com_cal_flatatt

The astronomer can use an *attached* calibration template inserting it in an OB after one or more observation templates. The fibres and the general instrument setup will remain the same as defined by acquisition and observation templates.
At P2PP level NO PARAMETERS must be set by the user: the best exposure time for a given configuration will be found during the testing phases at Paranal and stored on Flames CCS On−Line Data Base structure. The same will be done for number of exposures (which we expect to be about 3).

8.2 Detector calibration

Four templates are available (not to the astronomer) in order to perform detector calibrations:

FLAMES_uves_cal_dark **FLAMES_uves_cal_bias**
FLAMES_giraf_cal_dark **FLAMES_giraf_cal_bias**

A dark frame requires a finite exposure time in order to measure the dark current of a CCD. At P2PP level the number of exposures is also required.
For *bias frames* only 1 parameter is required: number of exposures.

FLAMES_uves_cal_flat	1
Exp. No.	1
UVES central wavelength (nm)	580
Plate name	1
UVES Calibration Type – ODD EVEN ALL	ODD+EVEN+ALL
Spiral R at 0 deg (micron)	180000
Spiral R at 360 deg (micron)	170000
Number of sweeps	2
Park UVES fibres before configuration	☑ True
Configure fibres before calbration	☑ True
Uves Slit Mode	8FIB

Figure 3 − example of FLAMES Standalone *flat−field* Calibration Templates

FLAMES_uves_cal_wave	1
Exp. No.	1
UVES central wavelength (nm)	860
Plate name	2
UVES Calibration Type − ODD EVEN ALL	EVEN
Spiral R at 0 deg (micron)	180000
Spiral R at 360 deg (micron)	170000
Calibration lamp type	THORIUM
Number of sweeps	1
Exposure time of each fibre (sec)	2.5
Calibration method	SWEEP
Park UVES fibres before configuration	☑ True
Configure fibres before calbration	☑ True
Uves Slit Mode	7+1FIB

Figure 4 − example of FLAMES Standalone *wavelength* Calibration Templates

8.3 Stand−alone calibration

These templates are not intended to be used by the astronomers but only by the Paranal team.
They may be grouped in two categories:

the *flat−field* group

FLAMES_uves_cal_flat
FLAMES_giraf_cal_flat

the *wavelength* group

FLAMES_uves_cal_wave
FLAMES_giraf_cal_wave

An example, at P2PP level, of both groups (for UVES spectrograph) is reported in Figures 3 and 4.

For UVES the user has to choose the *Uves slit mode* needed for the calibration: 8FIB, 7+1FIB or 6FIB. Other parameters to be choosen are: 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 one round (360°) spiral pattern and illuminating them with the calibration lamp. To position fibres, on this pattern, **FP** needs to know only the initial and the final radius R.

For both calibration types also the number of sweeps over fibres is requested, while for *wavelength* calibrations the user will have to select the calibration lamp type (Thorium or Neon), the method to calibrate fibres with robot (Sweep or Visit) and how long to pause above each fibre (Exposure time). This last parameter in not required for *flat−field* calibrations because the sweep is made without pausing.
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 before the calibration.

For stand−alone calibrations the exposure time (intended as *shutter* opening time) is not requested to the user but is automatically computed at template script level (depending by stand−alone calibration group and by instrument sub−mode).

8.4 Technical calibration

These templates will be used only for UVES technical and calibration tests. They are:

1) **FLAMES_uves_tec_fmtchk**
2) **FLAMES_uves_tec_orderdef**
3) **FLAMES_uves_tec_sflat**

The first template performs the format check calibration using the *wavelength* lamp. The second one has been devised to get the order definitions (by mean of *flat−field* lamp).
Both of them make use of the simultaneous fibre.
The last one is the only FLAMES template which does not make use of fibres, as it is, actually, a *flat−field* calibration for UVES (echelle mode).

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

A. FLAMES Template Signature Files (for astronomers)

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

Sometimes a few keywords that should have a fixed value may assume more than one value, depending on a previous setup chosen by the user.
For example **OCS3.INS.LAMP** keyword in **FLAMES_uves_obs_exp.tsf** may be:

"NOFIBRE" (if 8FIB or 6FIB)
"WLFIBRE#" (if 7+1FIB)

this means that at *script* level the choice will be done (in this case through a check of Uves mode and plate number used by current configuration).

Instrumental keywords have always a prefix identifying the sub−system involved: **OCS1** is for Fiber Positioner sub−system, **OCS2** is for Giraffe one and **OCS3** is for Uves one.

Note that for Acquisition Templates all keywords generated by FPOSS program and then written in PAF file are not reported in Tables A1, A2 and A3 (as PAF file generated for Medusa mode contains tipically more than 1500 keyword lines!).

Briefly parameters read from FPOSS may be 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** (and related total Fibre number).

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

Table A1

FLAMES_giraf_acq.tsf		
To be specified:		
Keyword	Range	Label in P2PP
OCS1.INS.TARG.SETUP	*.ins	Target Setup File from FP
OCS1.INS.TIME	1 .. 36000	Planned whole time for this OB (sec)
TEL.GIRAFFE.WLEN	L385.7 L427.2 L479.7 L543.1 L614.2 L682.2 L773.4 L881.7 H379.0 H395.8 H412.4 H429.7 H447.1 H465.6 H484.5 H504.8 H525.8 H548.8 H572.8 H599.3 H627.3 H651.5 H679.7 H710.5 H737.0 H769.1 H805.3 H836.6 H875.7 H920.5	Giraffe configuring wavelength (nm)
Fixed values:		
Keyword	Value	Label (not seen in P2PP)
OCS1.INS.ADC.USED	F	FP Argus ADC used flag
OCS1.INS.CFGTIM	AUTO	Configuration time flag
OCS1.INS.PCC.AMBI.TEMP	AUTO	ASM param. flag: temperature
OCS1.INS.PCC.AMBI.PRES	AUTO	ASM param. flag: atmospheric pressure
OCS1.INS.PCC.AMBI.RHUM	AUTO	ASM param. flag: relative humidity
SEQ.PRESET	T	Preset flag
TEL.TARG.TYPE	COORDINATE	type definition
Parameters read from FPOSS:	*(Target Setup File from FP)*	
Keyword	Value	Label
TEL.TARG.RA	Ra()	RA of the Field Center
TEL.TARG.DEC	Dec()	DEC of the Field Center
TEL.TARG.EQUINOX	2000	Equinox of Ra/Dec
INS.MODE	GIRAF	Instrument mode
INS.GIRAF.MODE	MED IFU ARG	Giraffe mode

Table A2

FLAMES_com_acq.tsf		
To be specified:		
Keyword	Range	Label in P2PP
OCS1.INS.TARG.SETUP	*.ins	Target Setup File from FP
OCS1.INS.TIME	1 .. 36000	Planned whole time for this OB (sec)
TEL.UVES.WLEN	520 580 860	Uves configuring wavelength (nm)
TEL.GIRAFFE.WLEN	L385.7 L427.2 L479.7 L543.1 L614.2 L682.2 L773.4 L881.7 H379.0 H395.8 H412.4 H429.7 H447.1 H465.6 H484.5 H504.8 H525.8 H548.8 H572.8 H599.3 H627.3 H651.5 H679.7 H710.5 H737.0 H769.1 H805.3 H836.6 H875.7 H920.5	Giraffe configuring wavelength (nm)
Fixed values:		
Keyword	Value	Label (not seen in P2PP)
OCS1.INS.ADC.USED	F	FP Argus ADC used flag
OCS1.INS.CFGTIM	AUTO	Configuration time flag
OCS1.INS.PCC.AMBI.TEMP	AUTO	ASM param. flag: temperature
OCS1.INS.PCC.AMBI.PRES	AUTO	ASM param. flag: atmospheric pressure
OCS1.INS.PCC.AMBI.RHUM	AUTO	ASM param. flag: relative humidity
SEQ.PRESET	T	Preset flag
TEL.TARG.TYPE	COORDINATE	type definition
Parameters read from FPOSS:	*(Target Setup File from FP)*	
Keyword	Value	Label
TEL.TARG.RA	Ra()	RA of the Field Center
TEL.TARG.DEC	Dec()	DEC of the Field Center
TEL.TARG.EQUINOX	2000	Equinox of Ra/Dec
INS.MODE	COM	Instrument mode
INS.UVES.SLIT	8FIB 7+1FIB 6FIB	Uves slit mode
INS.GIRAF.MODE	MED IFU ARG	Giraffe mode

Table A3

FLAMES_uves_obs_exp.tsf		
To be specified:		
`Keyword`	`Range`	`Label in P2PP`
OCS3.INS.GRAT2.WLEN	520 580 860	UVES central wavelength (nm)
OCS3.DET2.WIN1.UIT1	0 .. 36000	UVES exposure time (sec)
SEQ.NEXPO	0 .. 30	Number of exposures
Fixed values:		
`Keyword`	`Value`	`Label (not seen in P2PP)`
DPR.CATG	SCIENCE	Data product category
DPR.TYPE	OBJECT,OzPoz (if 8FIB or 6FIB) OBJECT,SimCal (if 7+1FIB)	Data product type
DPR.TECH	MOS	Data product technique
OCS3.INS.LAMP	NOFIBRE (if 8FIB or 6FIB) WLFIBRE1 WLFIBRE2 (if 7+1FIB)	Calibration lamp
OCS3.INS.GRAT2.SETTINGS	520 CD#3 SHP700 580 CD#3 SHP700 860 CD#4 OG590	Uves mode settings: [wavelength grating filter]
OCS3.DET2.EXP.TYPE	Normal	Exposure type

Table A4

FLAMES_giraf_obs_exp.tsf		
To be specified:		
Keyword	Range	Label in P2PP
OCS2.INS.GRAT.WLEN	L385.7 L427.2 L479.7 L543.1 L614.2 L682.2 L773.4 L881.7 H379.0 H395.8 H412.4 H429.7 H447.1 H465.6 H484.5 H504.8 H525.8 H548.8 H572.8 H599.3 H627.3 H651.5 H679.7 H710.5 H737.0 H769.1 H805.3 H836.6 H875.7 H920.5	GIRAFFE central wavelength (nm)
OCS2.DET1.WIN1.UIT1	0 .. 36000	GIRAFFE exposure time (sec)
SEQ.NEXPO	0 .. 30	Number of exposures
Fixed values:		
Keyword	Value	Label (not seen in P2PP)
DPR.CATG	SCIENCE	Data product category
DPR.TYPE	OBJECT	Data product type
DPR.TECH	MOS (if Medusa mode) IFU (if Ifu or Argus modes)	Data product technique
OCS2.INS.SLITLAMP	NONE	Lamp selection for the single slit calibration unit
OCS2.INS.SIMLAMP	TAL	Lamp slection for the simultaneous calibration box unit
OCS2.INS.REFOCUS	T	Refocus flag
OCS2.DET1.EXP.TYPE	Normal	Exposure type

Table A5

FLAMES_com_obs_exp.tsf		
To be specified:		
Keyword	Range	Label in P2PP
OCS2.INS.GRAT.WLEN	L385.7 L427.2 L479.7 L543.1 L614.2 L682.2 L773.4 L881.7 H379.0 H395.8 H412.4 H429.7 H447.1 H465.6 H484.5 H504.8 H525.8 H548.8 H572.8 H599.3 H627.3 H651.5 H679.7 H710.5 H737.0 H769.1 H805.3 H836.6 H875.7 H920.5	GIRAFFE central wavelength (nm)
OCS2.DET1.WIN1.UIT1	0 .. 36000	GIRAFFE exposure time (sec)
SEQ.NEXPOGIR	0 .. 30	GIRAFFE number of exposures
OCS3.INS.GRAT2.WLEN	520 580 860	UVES central wavelength (nm)
OCS3.DET2.WIN1.UIT1	0 .. 36000	UVES exposure time (sec)
SEQ.NEXPOUVE	0 .. 30	UVES number of exposures
Fixed values:		
Keyword	Value	Label (not seen in P2PP)
DPR.CATG	SCIENCE	Data product category
DPR.TYPE	OBJECT,COMBINED (for Uves branch) OBJECT (for Giraffe branch)	Data product type
DPR.TECH	for Uves branch: MOS for Giraffe branch: MOS (if Medusa sub−mode) IFU (if Ifu or Argus sub−modes)	Data product technique
OCS2.INS.REFOCUS	T	Refocus flag (Giraffe)
OCS2.DET1.EXP.TYPE	Normal	Exposure type (Giraffe)
OCS2.INS.SLITLAMP	NONE	Lamp selection for the single slit calibration unit (Giraffe)
OCS2.INS.SIMLAMP	TAL	Lamp slection for the simultaneous calibration box unit (Giraffe)
OCS3.INS.LAMP	NOFIBRE (if 8FIB or 6FIB) WLFIBRE1 (if 7+1FIB) WLFIBRE2 (if 7+1FIB)	Calibration lamp (Uves)
OCS3.INS.GRAT2.SETTINGS	520 CD#3 SHP700 580 CD#3 SHP700 860 CD#4 OG590	Uves mode settings: [wavelength grating filter]
OCS3.DET2.EXP.TYPE	Normal	Exposure type (Uves)

Table A6

FLAMES_uves_cal_flatatt.tsf		
Fixed values:		
`Keyword`	`Value`	`Label (not seen in P2PP)`
DPR.CATG	CALIB	Data product category
DPR.TYPE	LAMP,FLAT,ATTACH	Data product type
DPR.TECH	MOS	Data product technique
OCS3.DET2.EXP.TYPE	Normal	Exposure type

Table A7

FLAMES_giraf_cal_flatatt.tsf		
Fixed values:		
`Keyword`	`Value`	`Label (not seen in P2PP)`
DPR.CATG	CALIB	Data product category
DPR.TYPE	LAMP,FLAT	Data product type
DPR.TECH	MOS (if Medusa mode)	Data product technique
	IFU (if Ifu or Argus modes)	
OCS2.DET1.EXP.TYPE	Normal	Exposure type
OCS2.INS.REFOCUS	T	Refocus flag

Table A8

FLAMES_com_cal_flatatt.tsf		
Fixed values:		
`Keyword`	`Value`	`Label (not seen in P2PP)`
DPR.CATG	CALIB	Data product category
DPR.TYPE	for Uves branch: LAMP,FLAT,NASMYTH for Giraffe branch: LAMP,FLAT	Data product type
DPR.TECH	for Uves branch: MOS for Giraffe branch: MOS (if Medusa mode) IFU (if Ifu or Argus modes)	Data product technique
OCS2.DET1.EXP.TYPE	Normal	Exposure type (Giraffe)
OCS2.INS.REFOCUS	T	Refocus flag (Giraffe)
OCS2.DET1.WIN1.UIT1	coded value	Exposure time (Giraffe)
SEQ.NEXPOGIR	coded value	Number of exposures (Giraffe)
OCS3.DET2.EXP.TYPE	Normal	Exposure type (Uves)
OCS3.DET2.WIN1.UIT1	coded value	Exposure time (Uves)
SEQ.NEXPOUVE	coded value	Number of exposures (Uves)

Table A9

B. FLAMES Template Signature Files: calibration and technical (NOT for astronomers)

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

FLAMES_freegira_obs_exp.tsf		
To be specified:		
Keyword	Range	Label in P2PP
OCS2.DET1.WIN1.UIT1	0 .. 36000	Exposure time (sec)
SEQ.NEXPO	0 .. 30	Number of exposures
OCS2.INS.GRAT.NAME	HR LR	Grating name
OCS2.INS.GRAT.WLEN	365 .. 950	Central wavelength (nm)
OCS2.INS.GRAT.ORDER	2 .. 15	Grating order
OCS2.DET1.WIN1.BINX	1 .. 2	Binning mode along X
OCS2.INS.FILT.NAME	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
OCS2.INS.SLITLAMP	NONE HAL TAL NEL FFL	Lamp for single slit calibration unit
OCS2.INS.SLIT.NAME	Medusa1 Medusa2 IFU1 IFU2 ARGUS LongSlit	Slit / Plate selection
OCS2.INS.SIMLAMP	NONE HAL TAL NEL	Lamp for simultaneous calibration box unit
Fixed values:		
Keyword	Value	Label (not seen in P2PP)
DPR.CATG	SCIENCE	Data product category
DPR.TYPE	OBJECT	Data product type
DPR.TECH	MOS (if Medusa mode) IFU (if Ifu or Argus modes)	Data product technique
OCS2.INS.REFOCUS	T	Refocus flag (Giraffe)
OCS2.DET1.EXP.TYPE	Normal	Exposure type (Giraffe)

Table B1

FLAMES_uves_cal_dark.tsf		
To be specified:		
Keyword	Range	Label in P2PP
OCS3.DET2.WIN1.UIT1	0 .. 36000	Uves exposure time (sec)
SEQ.NEXPO	0 .. 30	Uves number of exposures
Fixed values:		
Keyword	Value	Label (not seen in P2PP)
DPR.CATG	CALIB	Data product category
DPR.TYPE	DARK	Data product type
DPR.TECH	IMAGE	Data product technique
INS.MODE	UVESCAL	Instrument mode
OCS3.DET2.EXP.TYPE	Dark	Exposure type

Table B2

FLAMES_uves_cal_bias.tsf		
To be specified:		
Keyword	Range	Label in P2PP
SEQ.NEXPO	0 .. 30	Uves number of exposures
Fixed values:		
Keyword	Value	Label (not seen in P2PP)
DPR.CATG	CALIB	Data product category
DPR.TYPE	BIAS	Data product type
DPR.TECH	IMAGE	Data product technique
OCS3.DET2.WIN1.UIT1	0	Uves exposure time (sec)
INS.MODE	UVESCAL	Instrument mode
OCS3.DET2.EXP.TYPE	Dark	Exposure type

Table B3

FLAMES_giraf_cal_dark.tsf		
To be specified:		
Keyword	Range	Label in P2PP
OCS2.DET1.WIN1.UIT1	0 .. 36000	Giraffe exposure time (sec)
SEQ.NEXPO	0 .. 30	Giraffe number of exposures
Fixed values:		
Keyword	Value	Label (not seen in P2PP)
DPR.CATG	CALIB	Data product category
DPR.TYPE	DARK	Data product type
DPR.TECH	IMAGE	Data product technique
INS.MODE	GIRCAL	Instrument mode
OCS2.DET1.EXP.TYPE	Dark	Exposure type
OCS2.INS.REFOCUS	F	Refocus flag

Table B4

FLAMES_giraf_cal_bias.tsf		
To be specified:		
Keyword	Range	Label in P2PP
SEQ.NEXPO	0 .. 30	Giraffe number of exposures
Fixed values:		
Keyword	Value	Label (not seen in P2PP)
DPR.CATG	CALIB	Data product category
DPR.TYPE	BIAS	Data product type
DPR.TECH	IMAGE	Data product technique
INS.MODE	GIRCAL	Instrument mode
OCS2.DET1.WIN1.UIT1	0	Giraffe exposure time (sec)
OCS2.DET1.EXP.TYPE	Dark	Exposure type
OCS2.INS.REFOCUS	F	Refocus flag

Table B5

FLAMES_uves_cal_flat.tsf		
To be specified:		
Keyword	Range	Label in P2PP
INS.UVES.SLIT	8FIB 7+1FIB 6FIB	Uves slit mode
SEQ.NEXPO	0 .. 30	Number of exposures
OCS3.INS.GRAT2.WLEN	520 580 860	Uves central wavelength (nm)
OCS1.INS.PLATE.NAME	1 2	Plate name
OCS1.INS.CAL.TYPE	ODD EVEN ALL ODD+EVEN+ALL	Uves calibration Type
OCS1.INS.STARTR	180000 ?	Spiral R at 0 deg (micron)
OCS1.INS.STOPR	170000 ?	Spiral R at 360 deg (micron)
OCS1.INS.NUM	1 .. 250	Number of sweeps over fibres
OCS1.INS.PARK	T F	Park UVES Fibres before configuration
OCS1.INS.CONFIG	T F	Configure fibres before calibration
Fixed values:		
Keyword	Value	Label (not seen in P2PP)
DPR.CATG	CALIB	Data product category
DPR.TYPE	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
DPR.TECH	MOS	Data product technique
OCS3.INS.GRAT2.SETTINGS	520 CD#3 SHP700 580 CD#3 SHP700 860 CD#4 OG590	Uves mode settings: [wavelength grating filter]
OCS3.DET2.EXP.TYPE	Normal	Exposure type
OCS1.INS.LAMP	TUNGSTEN	FP calibration lamp type
OCS1.INS.TIME	0	Exposure time of each fibre (sec)
OCS1.INS.CONT	SWEEP	Calibration method

Table B6

FLAMES_uves_cal_wave.tsf		
To be specified:		
Keyword	Range	Label in P2PP
INS.UVES.SLIT	8FIB 7+1FIB 6FIB	Uves slit mode
SEQ.NEXPO	0 .. 30	Uves number of exposures
OCS3.INS.GRAT2.WLEN	520 580 860	Uves central wavelength (nm)
OCS1.INS.PLATE.NAME	1 2	Plate name
OCS1.INS.CAL.TYPE	ODD EVEN ALL ODD+EVEN+ALL	Uves calibration Type
OCS1.INS.STARTR	180000 ?	Spiral R at 0 deg (micron)
OCS1.INS.STOPR	170000 ?	Spiral R at 360 deg (micron)
OCS1.INS.LAMP	THORIUM NEON	FP calibration lamp type
OCS1.INS.TIME	0 .. 250	Exposure time of each fibre (sec)
OCS1.INS.PARK	T F	Park UVES fibres before configuration
OCS1.INS.CONT	SWEEP VISIT	Calibration method
OCS1.INS.NUM	1	Number of sweeps over fibres
OCS1.INS.CONFIG	T F	Configure fibres before calibration
Fixed values:		
Keyword	Value	Label (not seen in P2PP)
DPR.CATG	CALIB	Data product category
DPR.TYPE	LAMP,WAVE,OzPoz (if 8FIB or 6FIB) LAMP,WAVE,SimCal (if 7+1FIB)	Data product type
DPR.TECH	MOS	Data product technique
OCS3.INS.GRAT2.SETTINGS	520 CD#3 SHP700 580 CD#3 SHP700 860 CD#4 OG590	Uves mode settings: [wavelength grating filter]
OCS3.DET2.EXP.TYPE	Normal	Exposure type

Table B7

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

Table B8

FLAMES_giraf_cal_wave.tsf		
To be specified:		
Keyword	Range	Label in P2PP
SEQ.NEXPO	0 .. 30	Giraffe number of exposures
OCS2.INS.GRAT.WLEN	L385.7 L427.2 L479.7 L543.1 L614.2 L682.2 L773.4 L881.7 H379.0 H395.8 H412.4 H429.7 H447.1 H465.6 H484.5 H504.8 H525.8 H548.8 H572.8 H599.3 H627.3 H651.5 H679.7 H710.5 H737.0 H769.1 H805.3 H836.6 H875.7 H920.5	Giraffe central wavelength (nm)
OCS1.INS.STARTR	180000 ?	Spiral R at 0 deg (micron)
OCS1.INS.STOPR	170000 ?	Spiral R at 360 deg (micron)
OCS1.INS.FIBTYPE	Medusa IFU	Fiber type − calibration mode
OCS1.INS.LAMP	THORIUM NEON	FP calibration lamp type
OCS1.INS.TIME	0 .. 250	Exposure time of each fibre (sec)
OCS2.INS.SIMLAMP	TAL NEL	Lamp slection for the simultaneous calibration box unit
OCS1.INS.PLATE.NAME	1 2	Plate name
OCS1.INS.PARK	T F	Park UVES fibres before configuration
OCS1.INS.NUM	1 .. 250	Number of sweeps over fibres
OCS1.INS.CONT	SWEEP VISIT	Calibration method
OCS1.INS.CONFIG	T F	Configure fibres before calibration
Fixed values:		
Keyword	Value	Label (not seen in P2PP)
DPR.CATG	CALIB	Data product category
DPR.TYPE	LAMP,WAVE	Data product type
DPR.TECH	MOS	Data product technique
INS.MODE	GIRAF	Instrument mode
OCS2.INS.SLITLAMP	NONE	Lamp selection for the single slit calibration unit
OCS2.INS.REFOCUS	T	Refocus flag
OCS2.DET1.EXP.TYPE	Normal	Exposure type

Table B9

FLAMES_uves_tec_fmtchk.tsf		
To be specified:		
Keyword	Range	Label in P2PP
OCS3.DET2.WIN1.UIT1	0 .. 36000	Uves exposure time
SEQ.NEXPO	0 .. 30	Number of exposures
OCS3.INS.GRAT2.WLEN	520 580 860	Uves central wavelength (nm)
OCS3.INS.LAMP	WLFIBRE1 WLFIBRE2	Calibration lamp slit
Fixed values:		
Keyword	Value	Label (not seen in P2PP)
DPR.CATG	CALIB	Data product category
DPR.TYPE	LAMP,FMTCHK,SimCal	Data product type
DPR.TECH	MOS	Data product technique
INS.MODE	UVESCAL	Instrument mode
OCS3.DET2.EXP.TYPE	Normal	Exposure type
OCS3.INS.GRAT2.SETTINGS	520 CD#3 SHP700	Uves mode settings:
	580 CD#3 SHP700	[wavelength grating filter]
	860 CD#4 OG590	

Table B10

FLAMES_uves_tec_orderdef.tsf		
To be specified:		
Keyword	Range	Label in P2PP
OCS3.DET2.WIN1.UIT1	0 .. 36000	Uves exposure time
SEQ.NEXPO	0 .. 30	Number of exposures
OCS3.INS.GRAT2.WLEN	520 580 860	Uves central wavelength (nm)
OCS3.INS.LAMP	FFFIBRE1 FFFIBRE2	Calibration lamp slit
Fixed values:		
Keyword	Value	Label (not seen in P2PP)
DPR.CATG	CALIB	Data product category
DPR.TYPE	LAMP,ORDERDEF,SimCal	Data product type
DPR.TECH	MOS	Data product technique
INS.MODE	UVESCAL	Instrument mode
OCS3.DET2.EXP.TYPE	Normal	Exposure type
OCS3.INS.GRAT2.SETTINGS	520 CD#3 SHP700	Uves mode settings:
	580 CD#3 SHP700	[wavelength grating filter]
	860 CD#4 OG590	

Table B11

FLAMES_uves_tec_sflat.tsf		
To be specified:		
Keyword	Range	Label in P2PP
OCS3.DET2.WIN1.UIT1	1 .. 36000	Uves exposure time
SEQ.NEXPO	1 .. 100	Number of exposures
SEQ.NOFF	1 .. 100	Number of offsets
OCS3.INS.LAMP	FFL3 FFL4	Flat field calibration lamp
OCS3.INS.SLIT3.WID	0.15 .. 10.0	Slit width
OCS3.INS.SLIT3.LEN	0.2 .. 30.0	Decker Height
OCS3.INS.SLIT3.OFFSETX	−5 .. 5	Decker offsets in arcsec
OCS3.INS.FILT3.NAME	FREE BG40 SHP700 OG590 BK7_5 BK7_10 BK7_15	Filter
OCS3.INS.GRAT2.NAME	CD#3 CD#4	Cross disperser id.
OCS3.INS.GRAT2.WLEN	500.0 .. 1100.0	Cross disperser wavelength
OCS3.INS.TIL2.POS	−220.0 .. 220.0	Camera tilt
OCS3.DET2.READ.SPEED	225kHz,1x1,low 50kHz,2x2,high 225kHz,1x2,low 50kHz,2x3,high 625kHz,1x1,low	Readout mode
Fixed values:		
Keyword	Value	Label (not seen in P2PP)
DPR.CATG	CALIB	Data product category
DPR.TYPE	LAMP,FLAT	Data product type
DPR.TECH	ECHELLE	Data product technique
OCS3.DET2.EXP.TYPE	Normal	Exposure type

Table B12

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