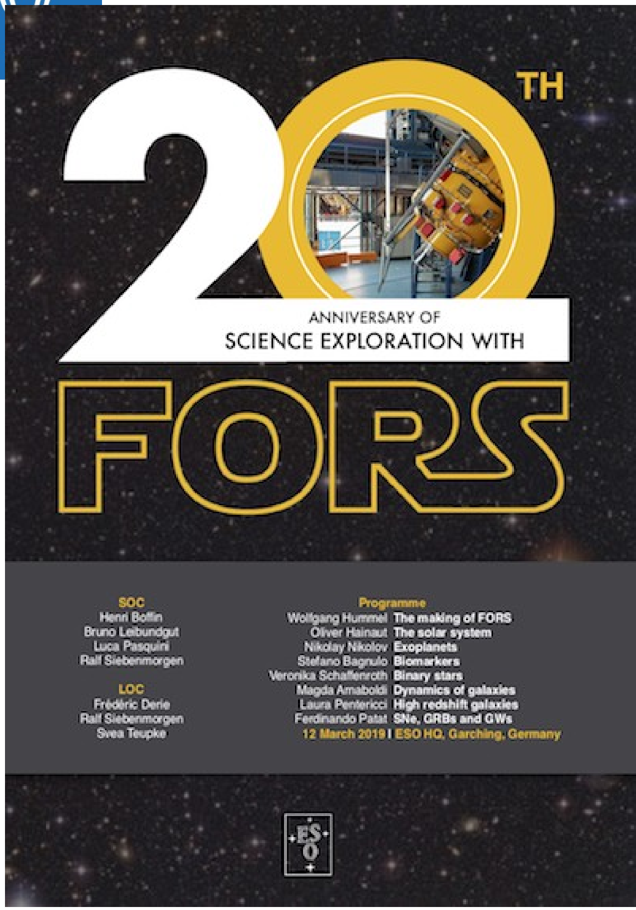

20TH
ANNIVERSARY OF
SCIENCE EXPLORATION WITH
FORS
SOC
Henri Boffin
Bruno Leibundgut
Luca Pasquini
Ralf Siebenmorgen
LOC
Frédéric Derie
Ralf Siebenmorgen
Svea Teupke
Programme
Wolfgang Hummel The making of FORS
Oliver Hainaut The solar system
Nikolay Nikolov Exoplanets
Stefano Bagnulo Biomarkers
Veronika Schaffenroth Binary stars
Magda Arnaboldi Dynamics of galaxies
Laura Pentericci High redshift galaxies
Ferdinando Patat SNe, GRBs and GWs
12 March 2019 | ESO HQ, Garching, Germany

Operations

- Outline

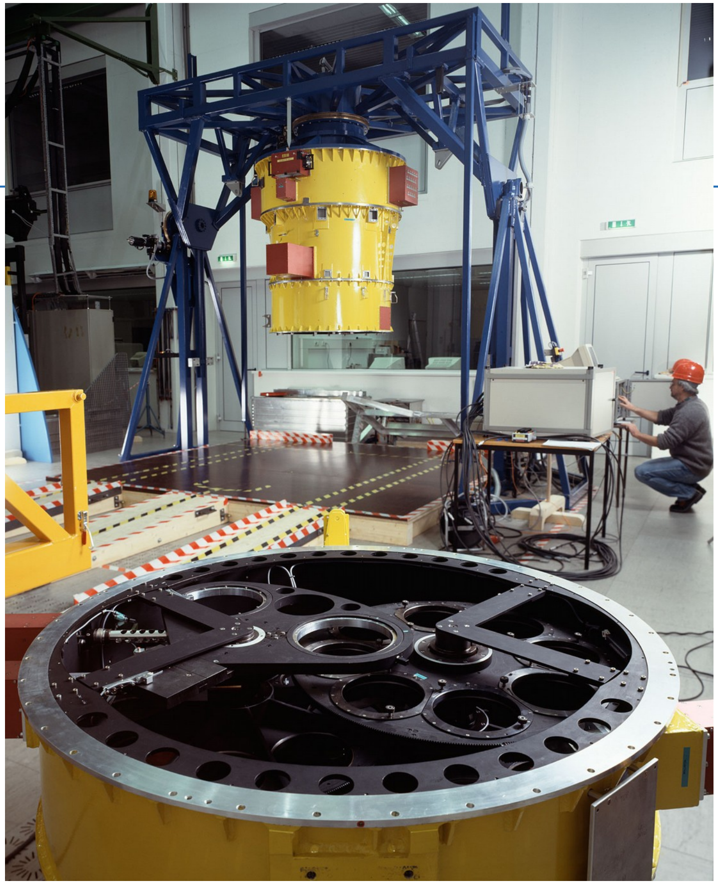
1 Instrument description

2 Instrument history and major events

3 Operations
  3.1 calibration plan
  3.2 data reduction pipeline
  3.3 data processing and quality control

4 Statistics and Summary

- Two instruments
- focal reducer, imaging
- spectroscopy
- polarimetry



FORS1	FORS2
imaging	imaging
long slit spectroscopy	long slit spectroscopy
MOS 19 slitlets	MOS 19 slitlets
	mask exchange unit
IPOL	→ since 2009
PMOS	→ since 2009
HIT (3 modes)	HIT (3 modes)
ECHELLE (until 2005)	

- FORS description

20 years means
40 observing periods,
40 User Manual versions

(compressed here into 6 slides)

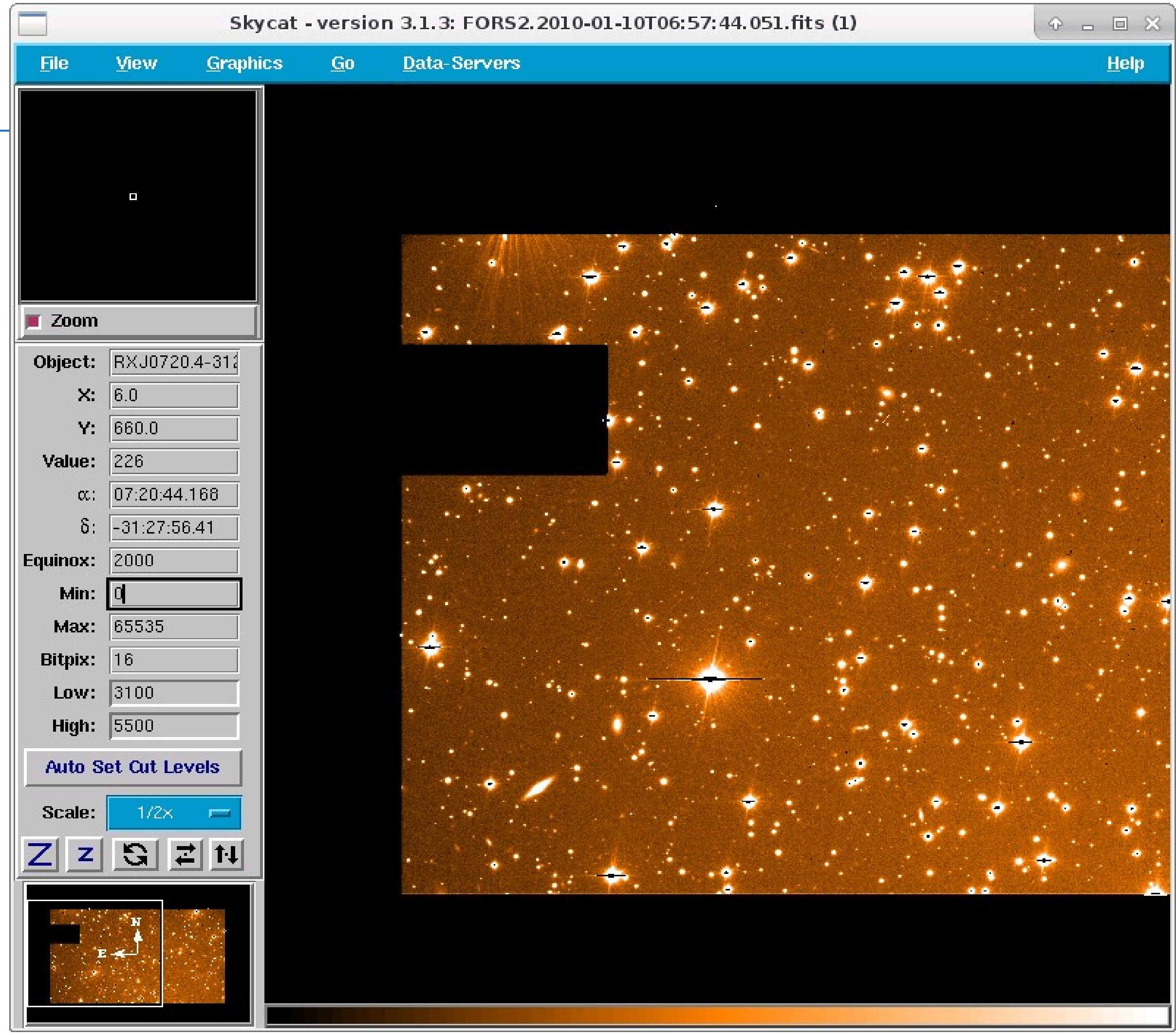
imaging, two collimators 6'.8 x 6'.8
0''.25/ pixel (SR, 2x2 binning)
 (plus HR collimator)

BB and NB filters (exchangeable)

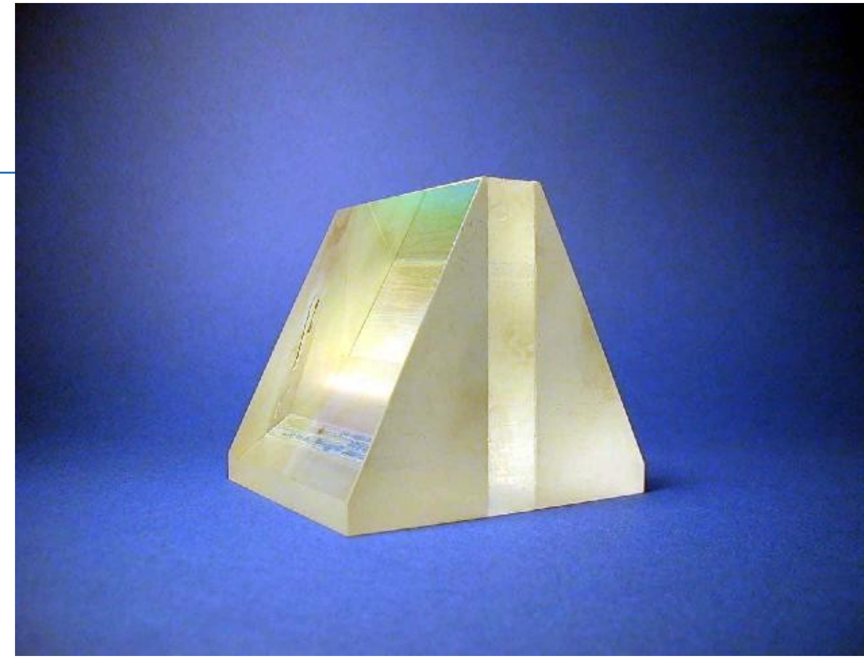
FORS description

Example raw frame, upper chip

Imaging with single or more MOS blades to **occult** bright saturating sources.
Preparation done via FIMS.



- FORS description



Low resolution spectroscopy with grisms

150I R= 260 eff = 80% surface rules
1400V R= 2100 eff = 90% VPH

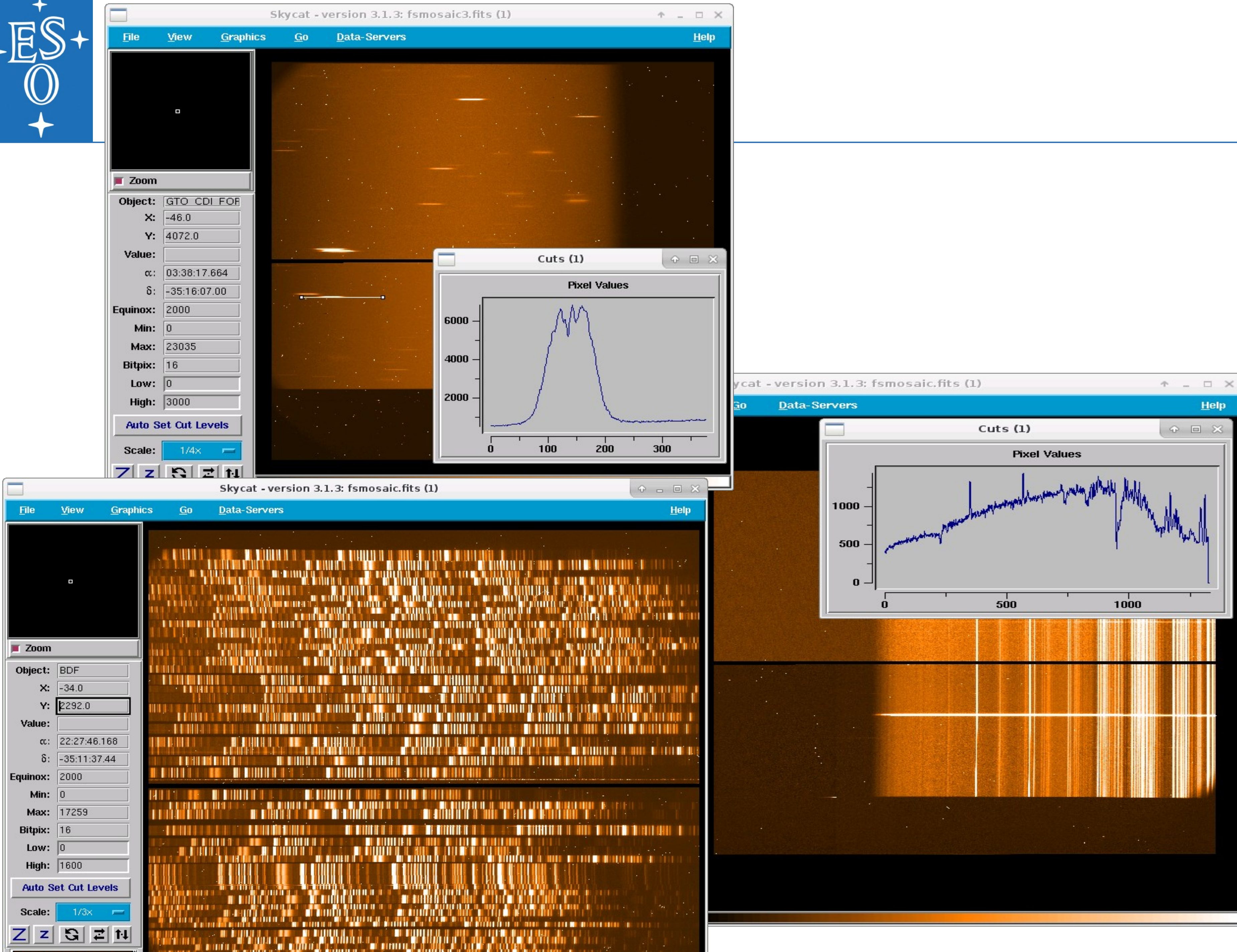
volume phased holographic grism, plus optional order separation filters.

In the focal plane:

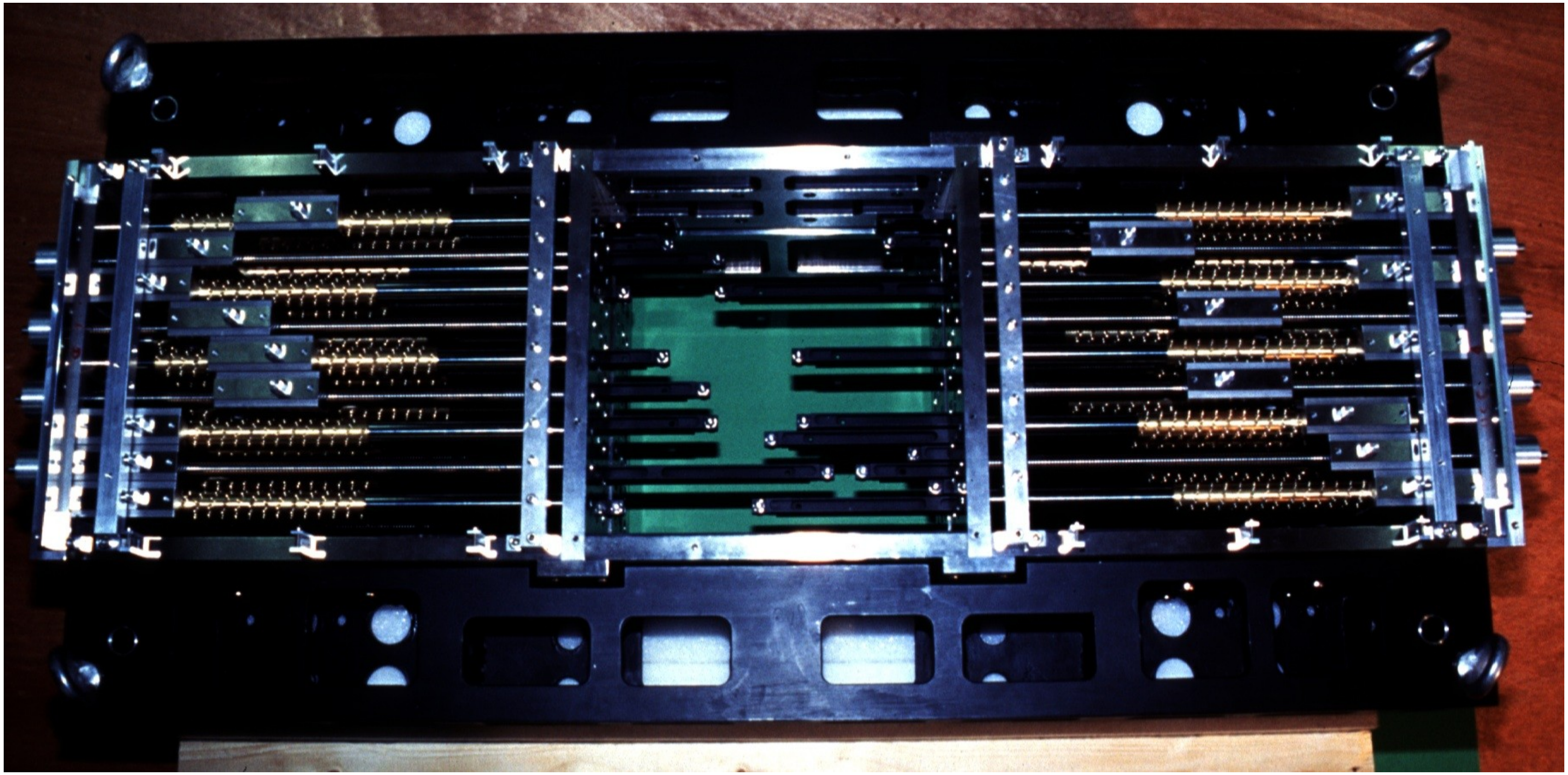
LSS : 9 slits from 0.3 – 2.5'' at fixed position in the focal plane (extended objects)

MOS: 19 slitlets, any slit width, 20'' long

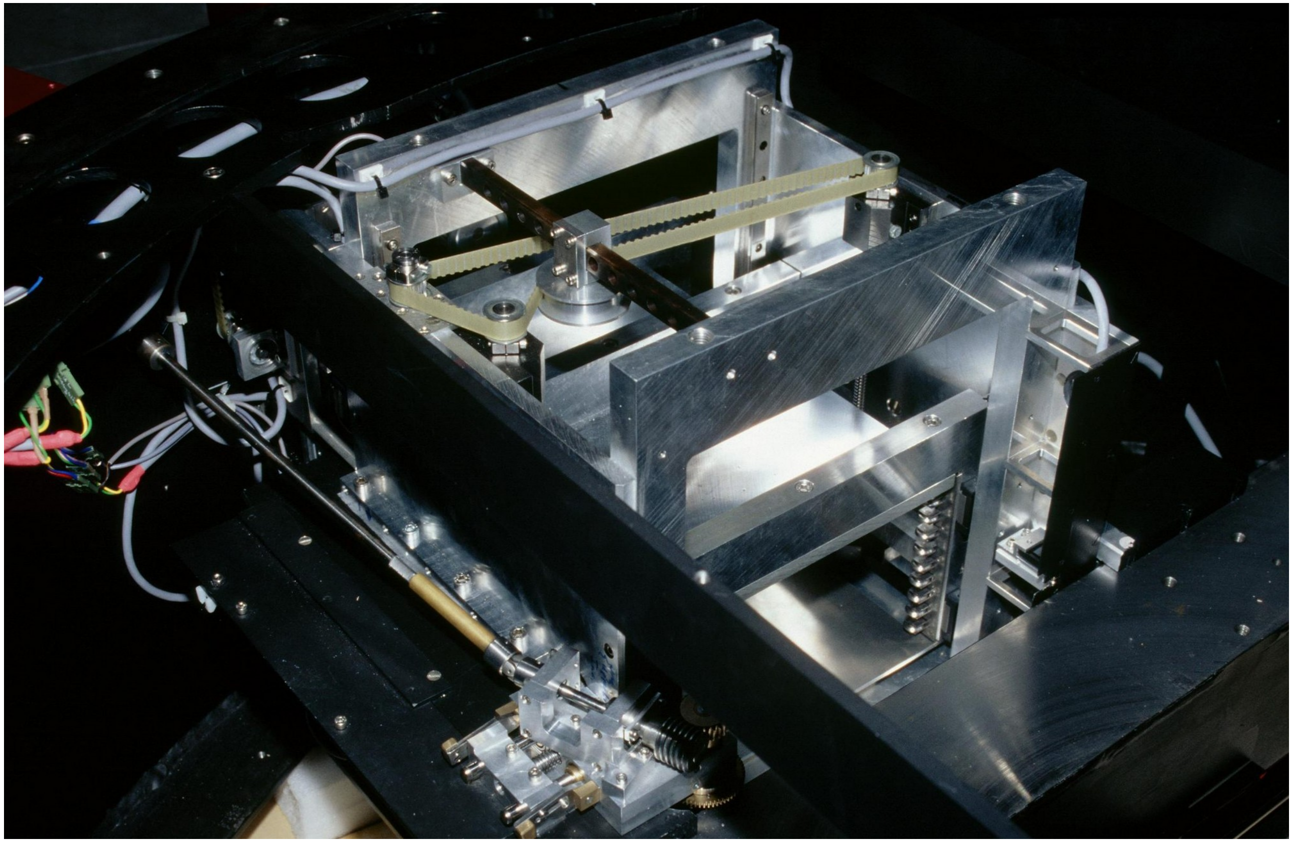
FORS2 only : MXU, any slit width and lengths, also tilted and curved slits
Mask prepared via FIMS,
LASER cut on site by external MMU and inserted into the instrument


Skycat - version 3.1.3: fsmosaic3.fits (1)
File View Graphics Go Data-Servers Help
Zoom
Object: GTO_CDI_FOF
X: -46.0
Y: 4072.0
Value:
α: 03:38:17.664
δ: -35:16:07.00
Equinox: 2000
Min: 0
Max: 23035
Bitpix: 16
Low: 0
High: 3000
Auto Set Cut Levels
Scale: 1/4x
Cuts (1)
Pixel Values
6000
4000
2000
0
100
200
300
Skycat - version 3.1.3: fsmosaic.fits (1)
File View Graphics Go Data-Servers Help
Zoom
Object: BDF
X: -34.0
Y: 2292.0
Value:
α: 22:27:46.168
δ: -35:11:37.44
Equinox: 2000
Min: 0
Max: 17259
Bitpix: 16
Low: 0
High: 1600
Auto Set Cut Levels
Scale: 1/3x
ycat - version 3.1.3: fsmosaic.fits (1)
Go Data-Servers Help
Cuts (1)
Pixel Values
1000
500
0
0
500
1000

MOS hardware

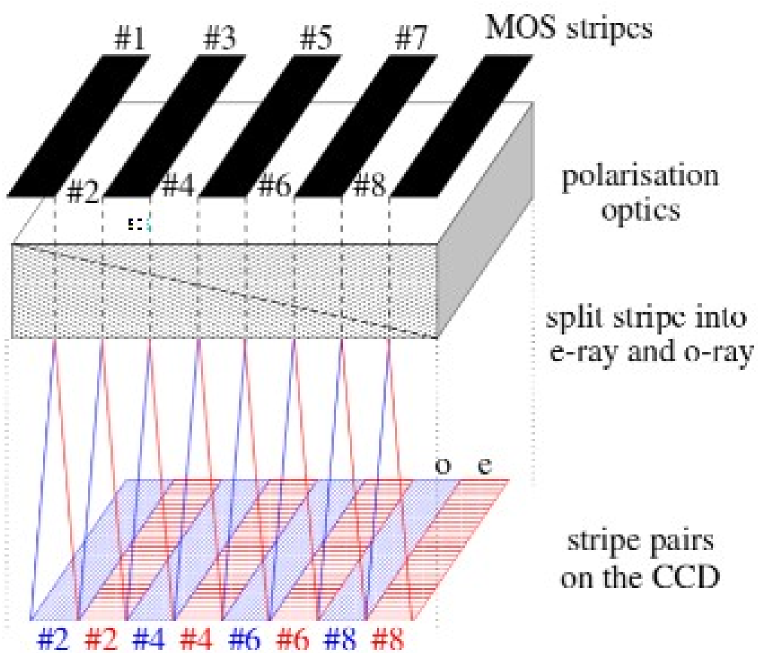


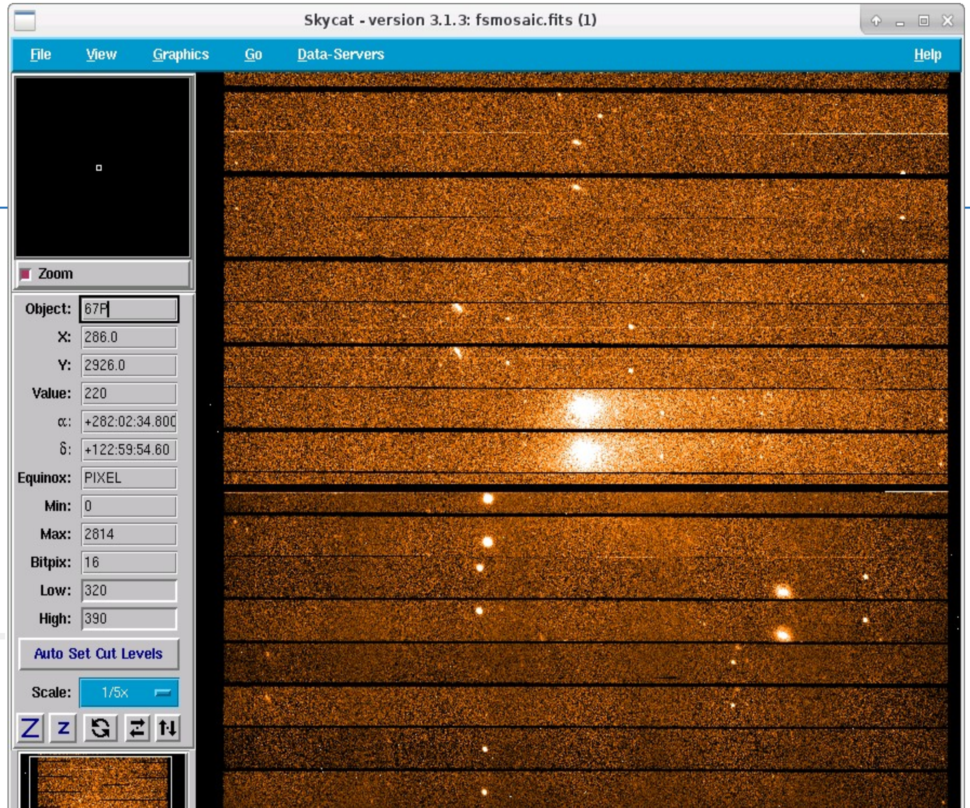
MXU hardware, 10 masks container inside, elevator

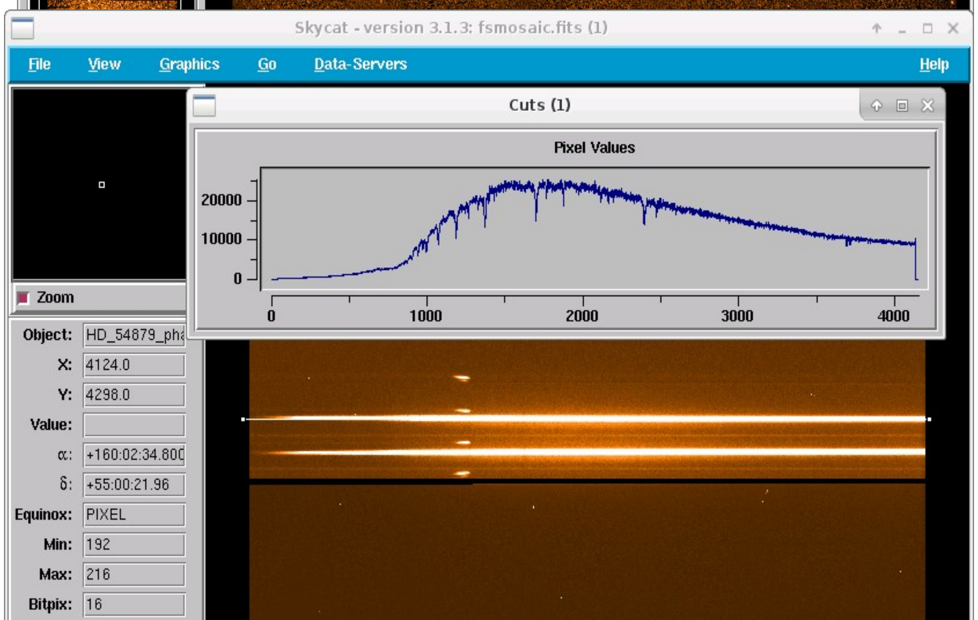


• PMOS, IPOL

odd MOS slit-blades occult sky,
even free MOS slit-blades
split up in two projected slices

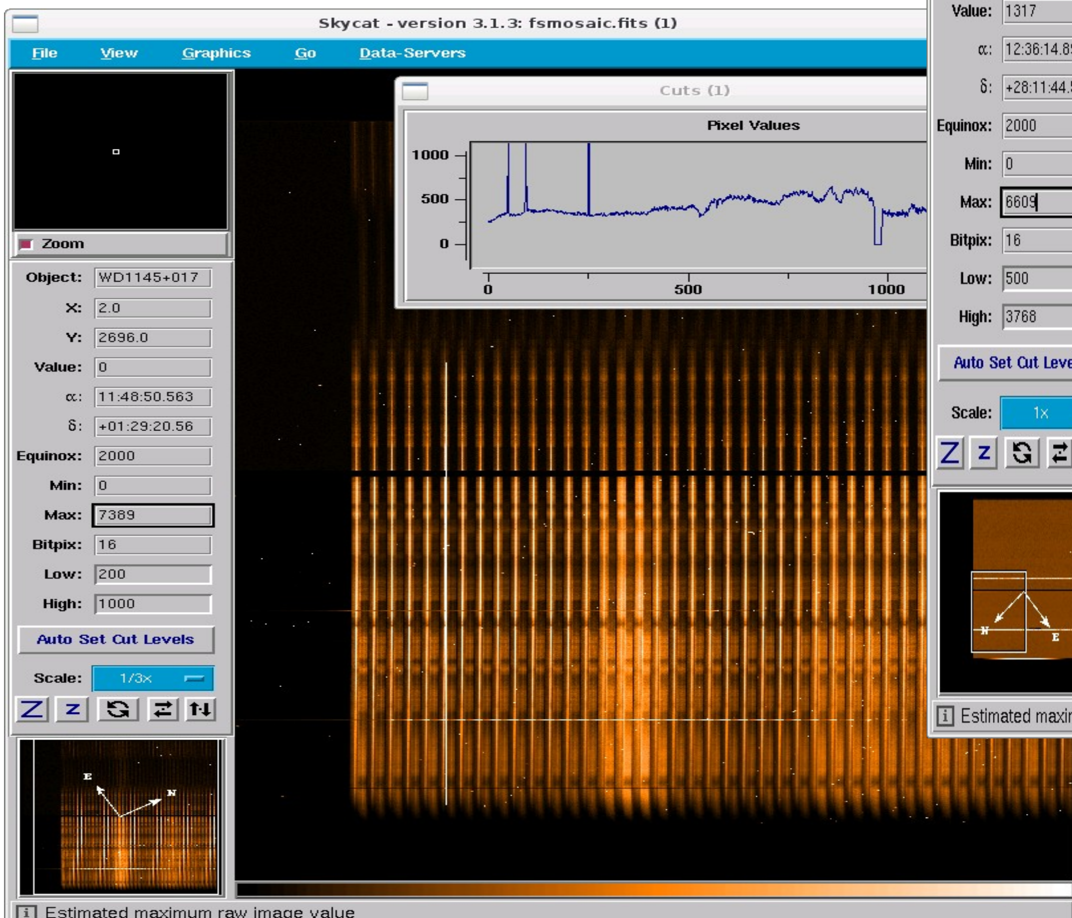


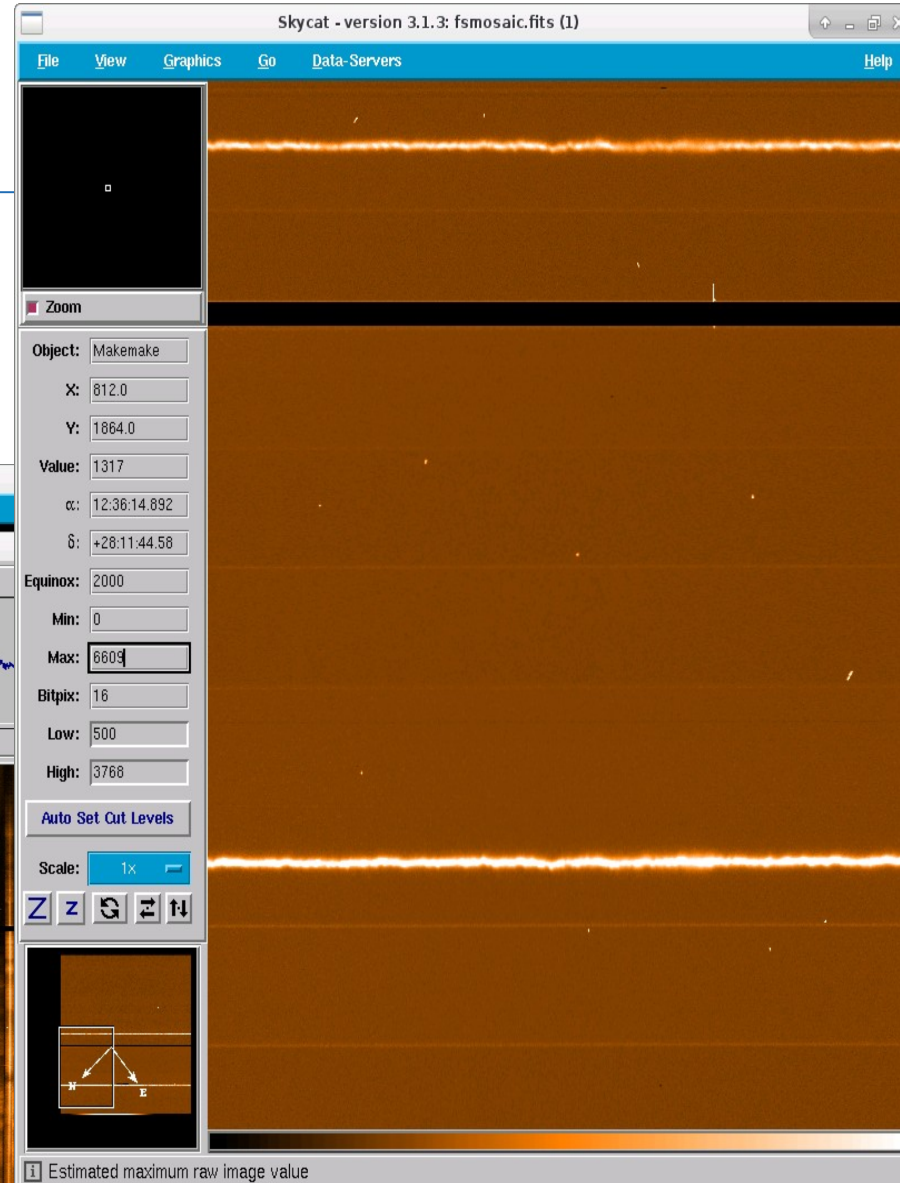




Imaging, spectroscopy, reference slit spectroscopy

- HIT modes





Two prisms, that move between 30mm to 1100mm,
the first one corrects the dispersion, second one corrects pupil tilt.
Up to airmass = 1.5

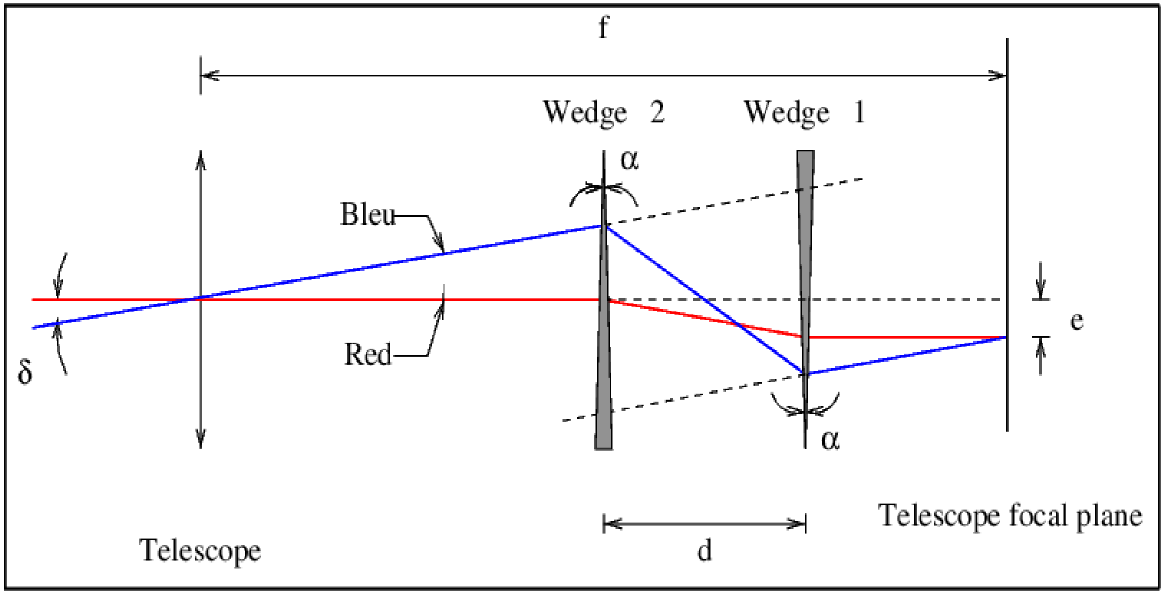


Figure 5: Optical design of the LADC

2.0 History

- 1998 09 FORS1 first light
- 1999 04 start of operations FORS1
- 2000 04 start of operations FORS2 with MXU and MMU
- 2002 04 **FORS2 upgrade red-optimized mosaic CCD**, VPH prism 1200B
- (2003 04 VIMOS, competitive instrument start)
- 2004 FORS1 → UT2, FORS2 → UT1, (first of more moves)
  operated with RRM
- 2005 Echelle mode decommissioned
- 2006 FORS1: new grism 1200B, LADC cleaning, new HIT mode multiple shift
- 2007 **FORS1 upgrade blue-sensitive mosaic CCD**

2.0 History ...

- Higher QE, lower RON, faster readout, 4k x 4k , larger spectral range
- cryostat, template modification, FIMS modification (already for FORS2), ETC, pipeline
- New UVBg Bessel and uvbgriz SDDS filter set
- Fringes at > 700 nm
- Szeifert et al., 2010,

  ESO Messenger, 128

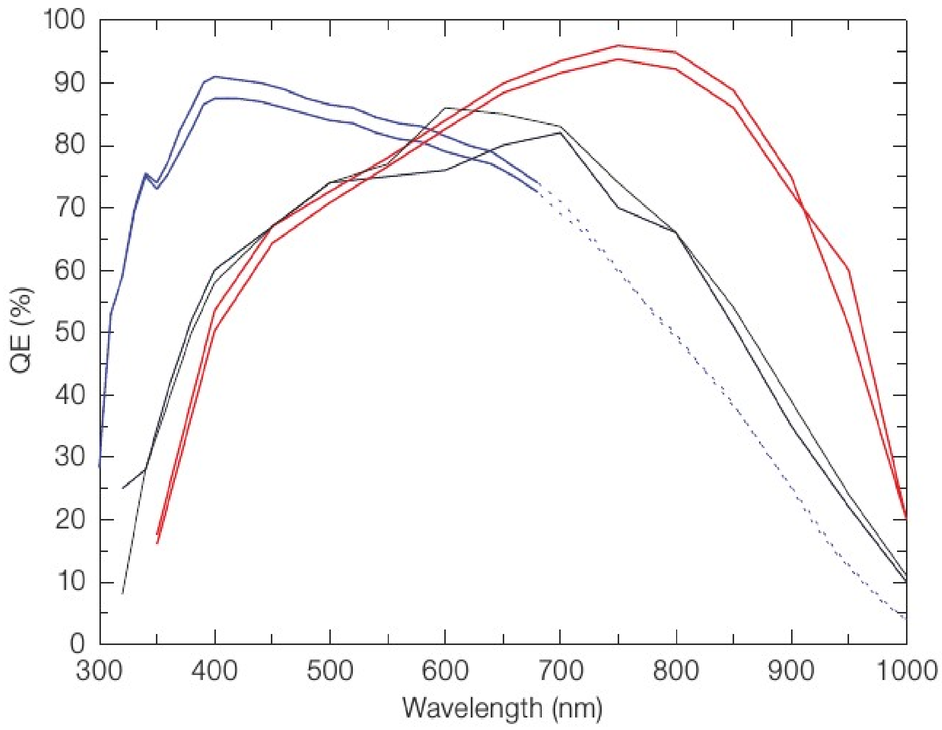


Figure 1: Comparison of the CCD efficiencies of FORS1 and FORS2 before and after the respective upgrades. Black: Tektronix CCDs; Red: FORS2 MIT CCDs; Blue: FORS1 E2V CCDs. The dotted part indicates the range affected by fringing (see text).

2.0 History

- 2007 multi-object spectroscopy pipeline released
- 2008 calibration plan modified: Landolt stars → Stetson fields
- 2009 **FORS1 decommissioned** (XSHOOTER requires UT2 Cassegrain)
  polarimetric optics -> FORS2
  high troughput BB filters and VPH grisms -> FORS2
  close out calibrations
  Rupprecht et al., 2010, ESO Messenger 140
  default: MIT (red) and visitor mode: E2V (blue) detectors used
- 2013 LADC anti-reflection coating removed
- 2014 virtual slit 6.0" offered for LSS
- 2015 major pipeline overhaul
- 2017 FIMS upgraded to work on Mac
- 2018 HIT modes decommissioned, VIMOS decommissioned
- 2019 *** 20th anniversary ***

Observation preparation Software

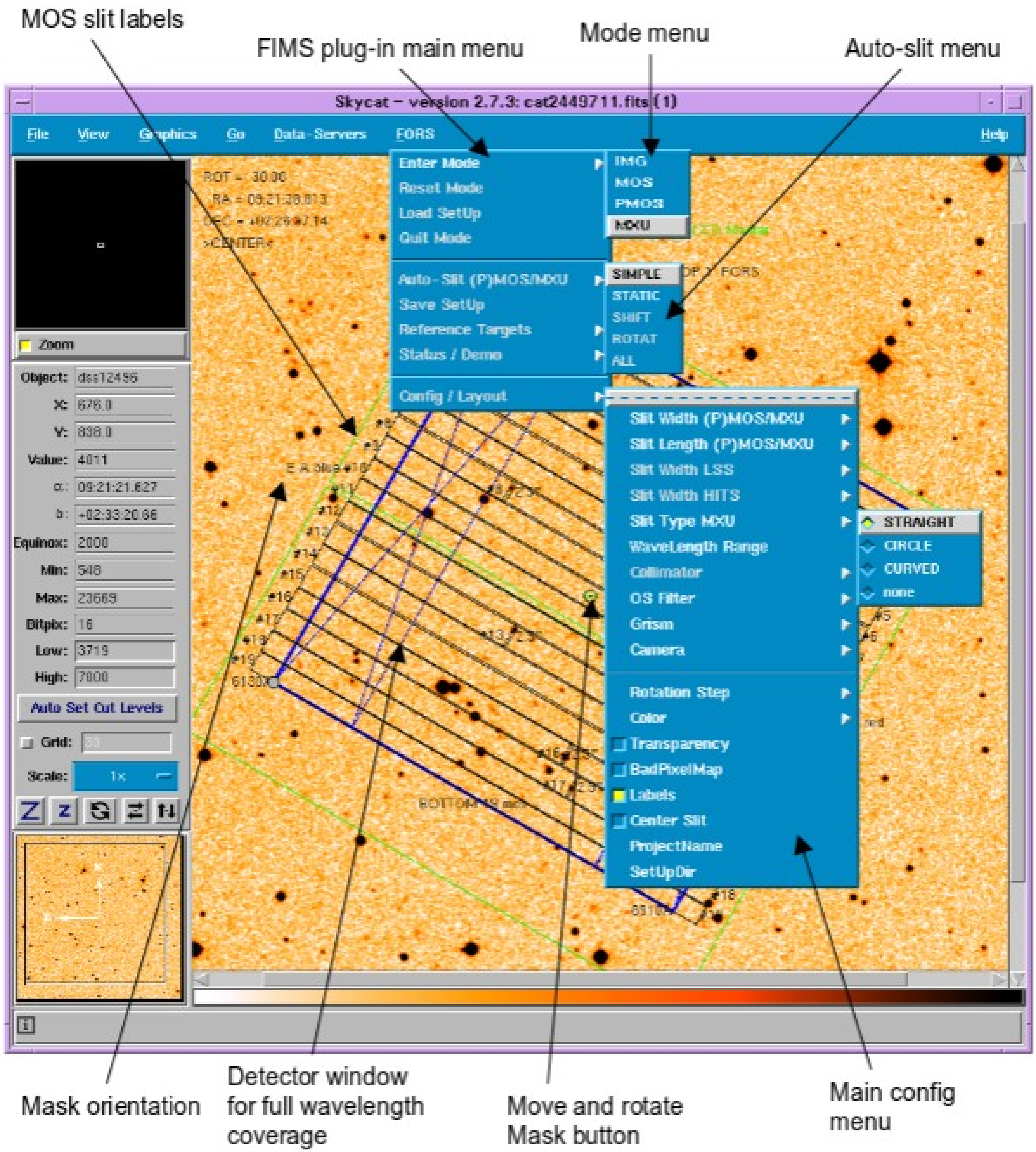
Plugin to SkyCat

Linear transformation between

Sky (RA, Dec)
focal plane (mm)
CCD (pixel)

Justifed: LADC, differential refraction at 7' x 7' and Z < 60deg negligible

(different for Flames, VIMOS)




Operations

3.0 Operations

- 3.1 calibration plan
- 3.2 pipeline
- 3.2 quality control

Both instruments fully integrated

in VLT dataflow: phase1/2, p2pp (now web-based p2),

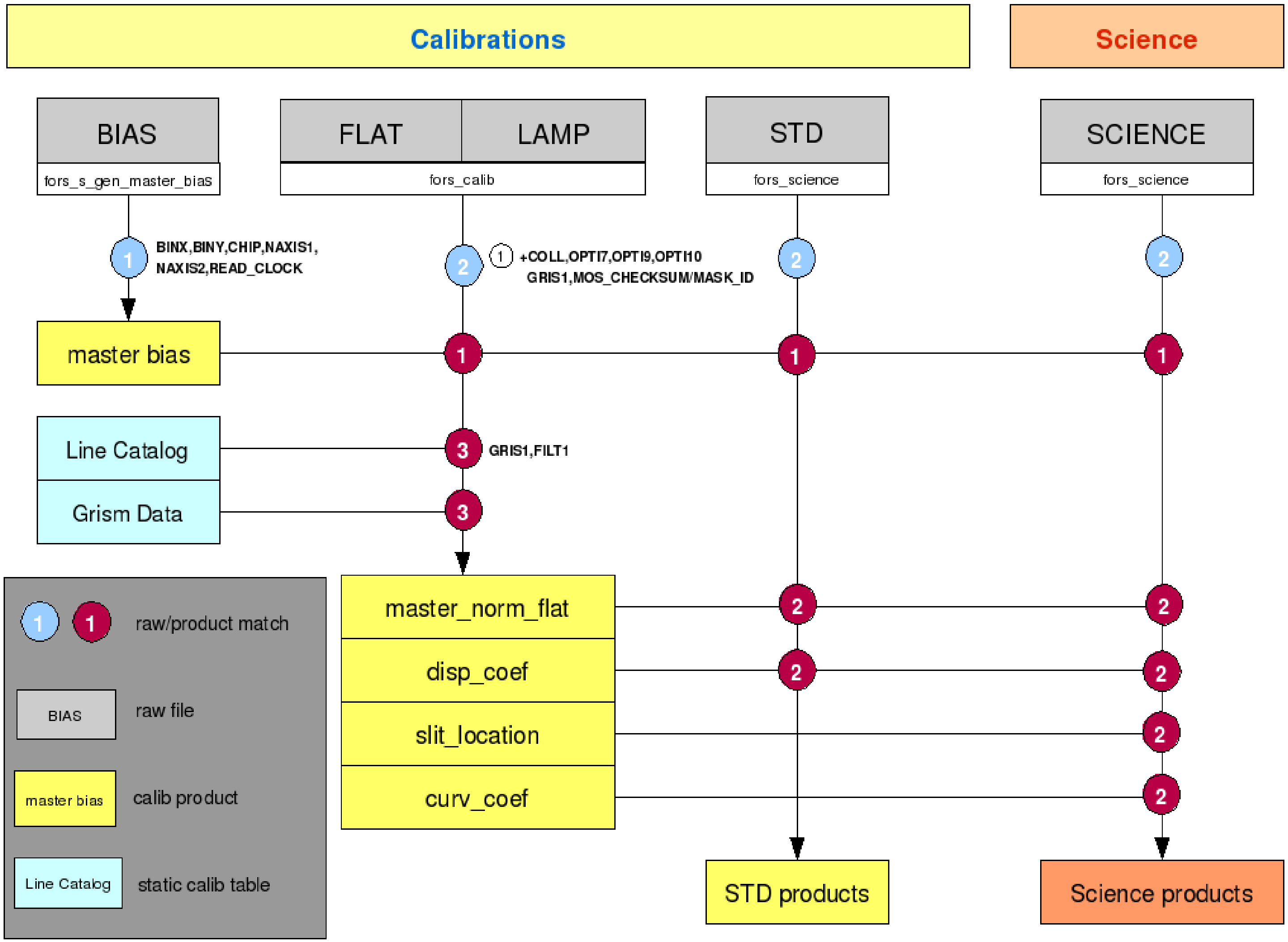
FIMS, OB execution by SciOps on P.

calChecker, QC0, QC1,

master calibrations, instrument monitoring, health check ...

Calibration plan

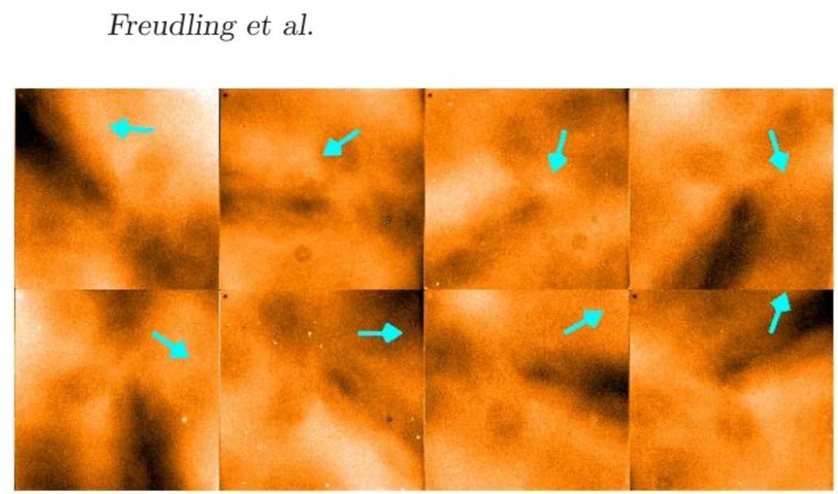
FORS2 MOS/MXU

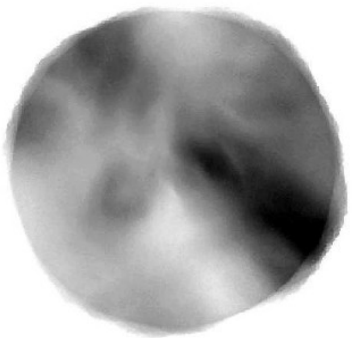


FORS photometry (FAP)

- FORS1 IOT secondary standards WG (Moeller, P. et al., 2005) reported:
  FORS calibration plan shows +-0.03 mag variation across the field
  - change the calibration plan, use Stetson instead of Landolt
  - investigate flat field strategy via FORS absolute photometry project.

- FAP project report (Freudling et al.) 3% accuracy can be achieved when using a correction of the flat field. Use more than one Stetson field in a night. (not clear if additive stray light or multiplicative transmission)



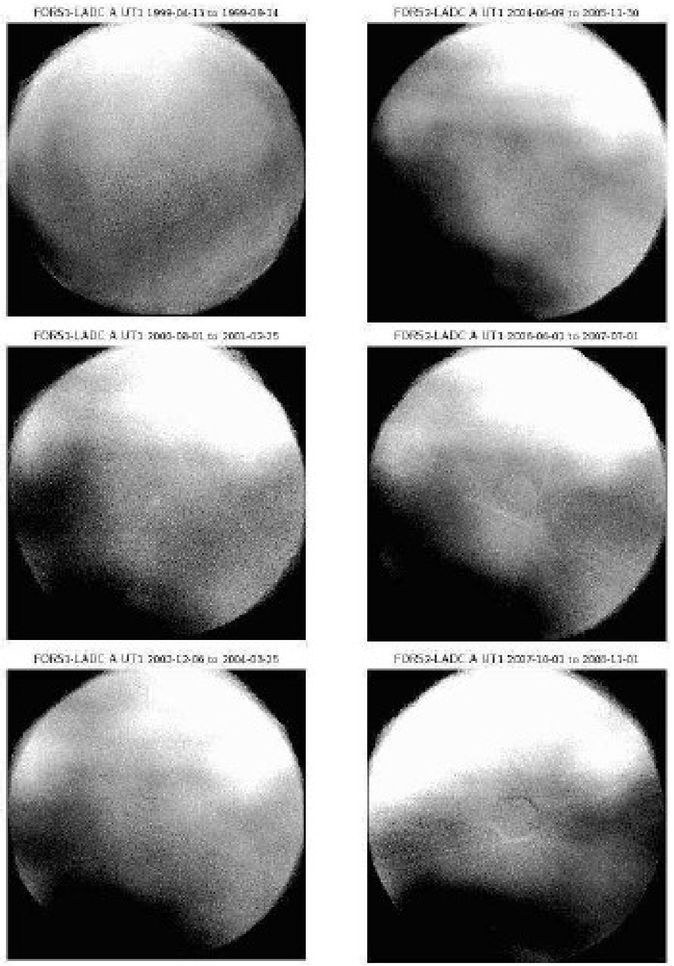


stacked B flat, rotation corrected

FORS photometry

- Flat field structure has one component rotating
  - structure moves with the LADC
  - is visible on the LADC surface
  - multiplicative (not stray light)

  Moehler, S. et. al., 2009, PASP 122



UT1, left FORS1, right FOR2,
twilight flats,
rotated to rot.angle = 0

FORS photometry

- Illumination corrections: static and rotating component, two time ranges (Coccato et al., 2013, MNRAS)

Removal of systematics in photometric data 1263

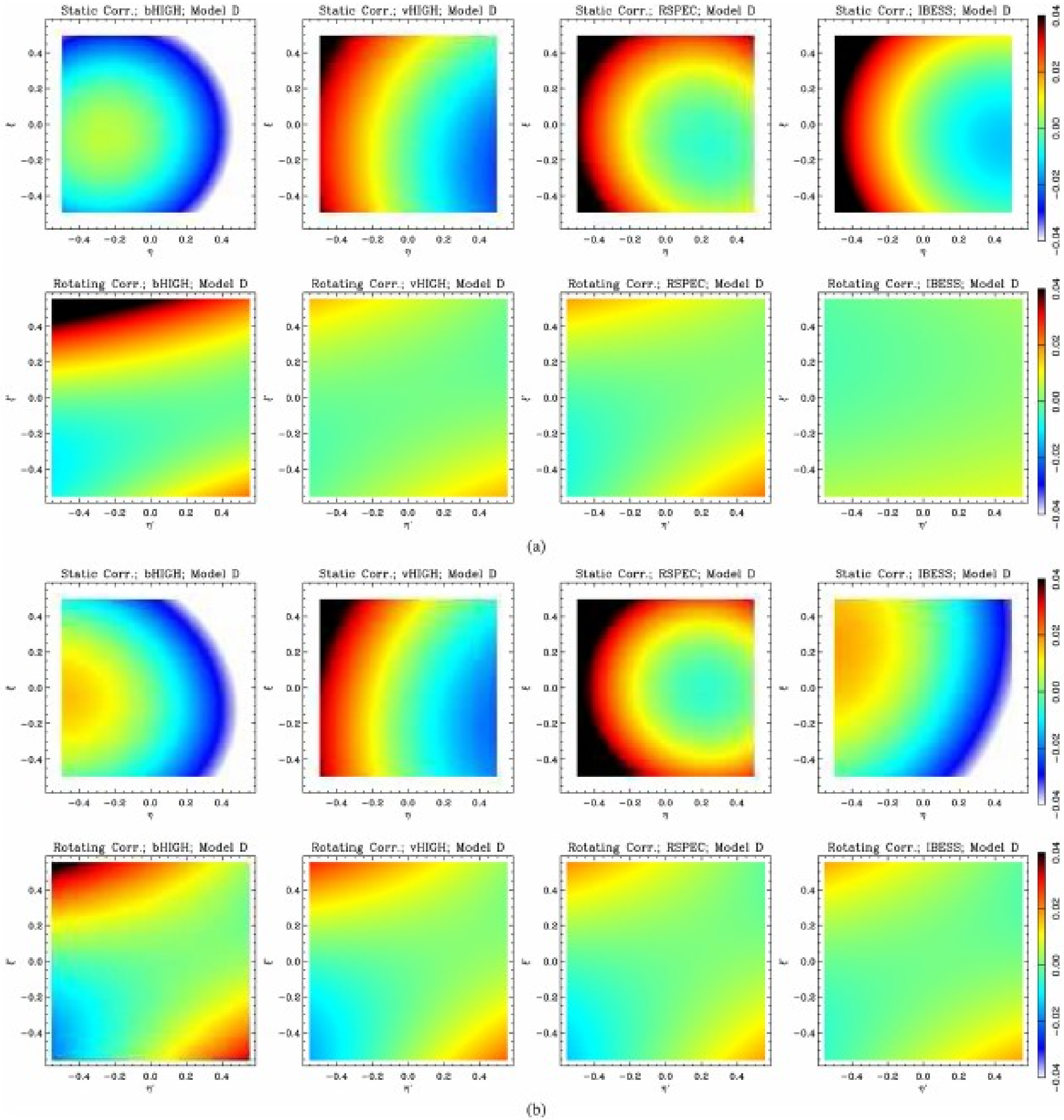
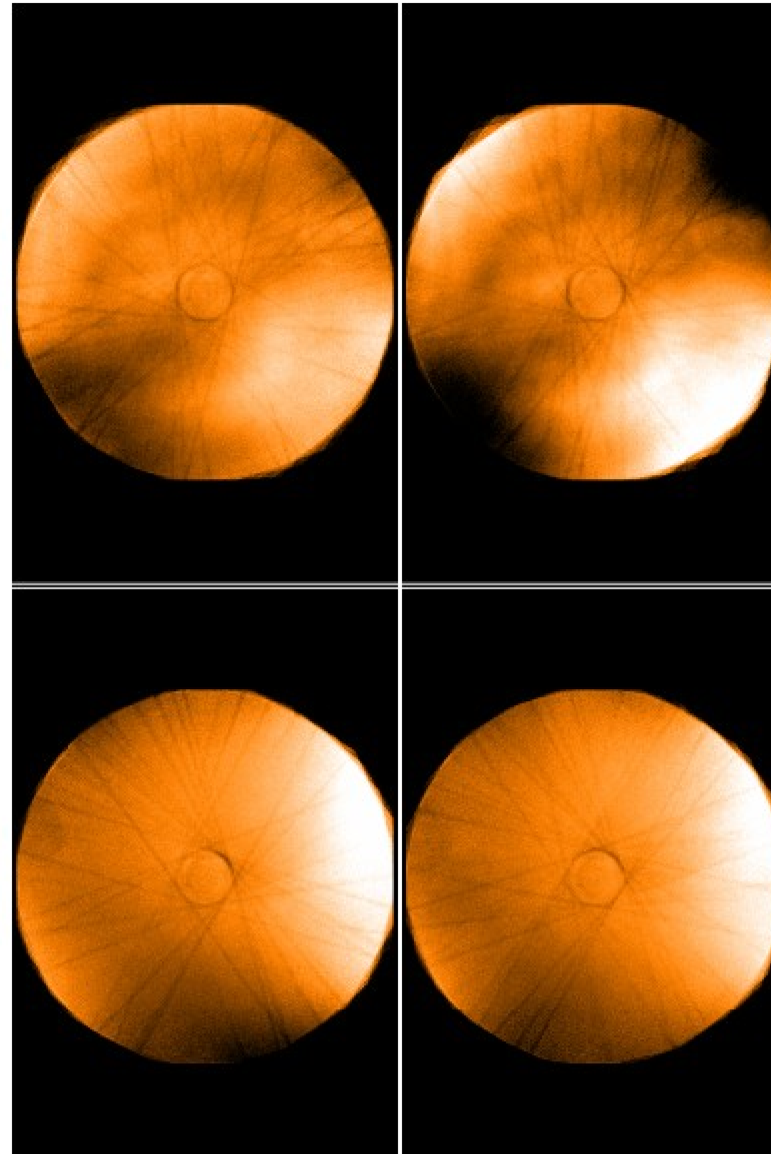


Figure 2. Best-fitting polynomial surfaces (model D) representing the static illumination corrections ΔF^{stat} (upper panels) and the rotating illumination corrections ΔF^{rot} (lower panels) for different filters. Illumination correction surfaces in panels (a) refer to time range A, whereas surfaces in panels (b) refer to

FORS photometry, Linear ADC, coating removed

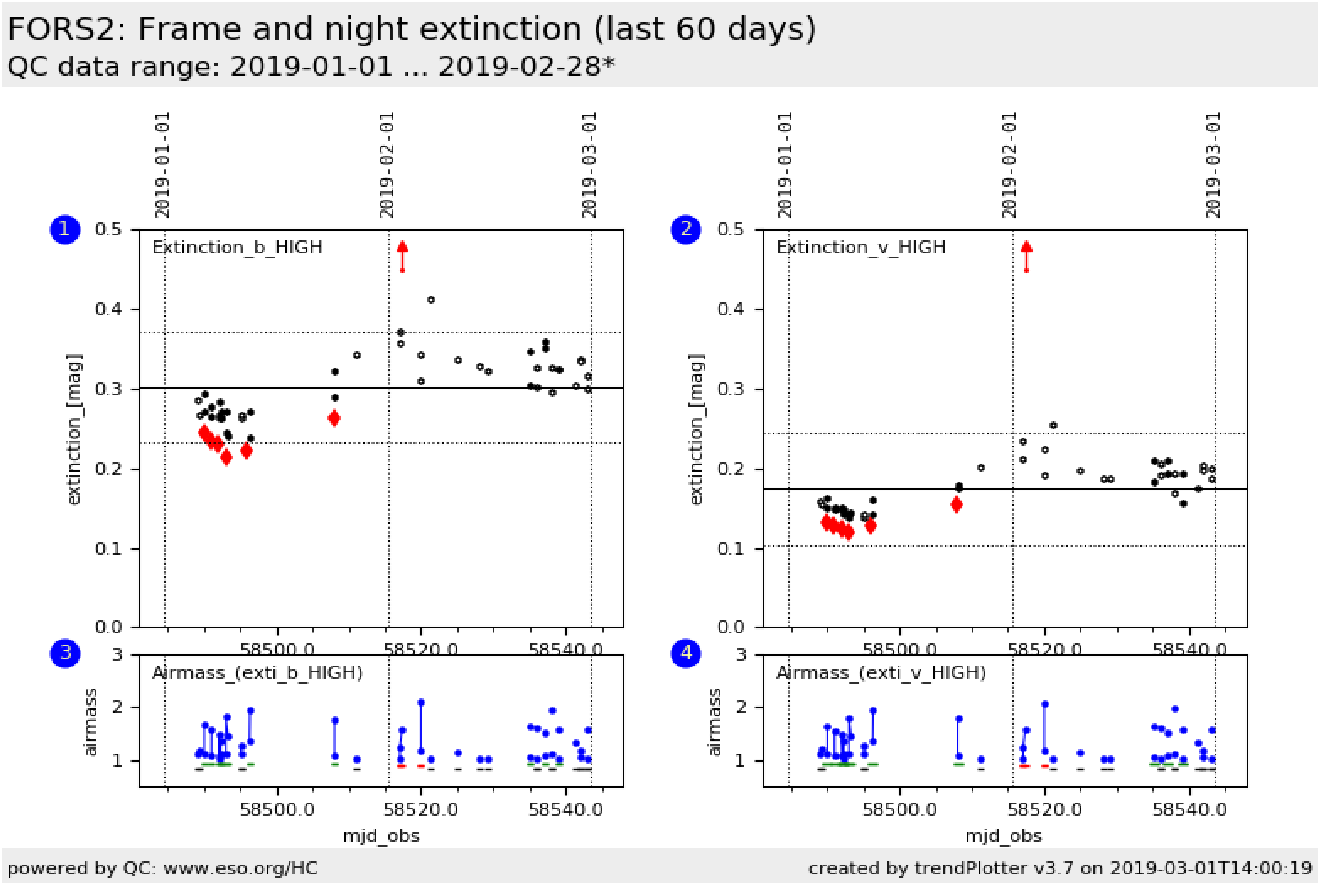
2014 anti-reflection coating removed from LADC, better zero-points, FF structure is gone, FORS is ready for exo-planet transition science (Boffin et al. 2016, SPIE 9989)



FORS photometry, 2011, new calibration plan

Following a simulation of Bramich et al. 2011: the calibration plan was modified: use two STDs at different air mass 18 photometric nights for the modeling: 1.4-1.8% accuracy can be achieved. (FAP final report)

Annual FAP verification report.



3.2 data reduction pipeline

- Data reduction pipelines play a critical role in the quality control of the instrument and the quality of the science observations
- 1999 data reduction SW delivered by LSW Heidelberg (Stahl, O., Szeifert) as an ESO-MIDAS context for IPOL MOS and PMOS including a graphical user interface and a data reduction cook book.

2.7 MOS Cookbook - A typical session

2.7.1 Starting the whole thing

Before you start the MOS context you should have done the following preparations:

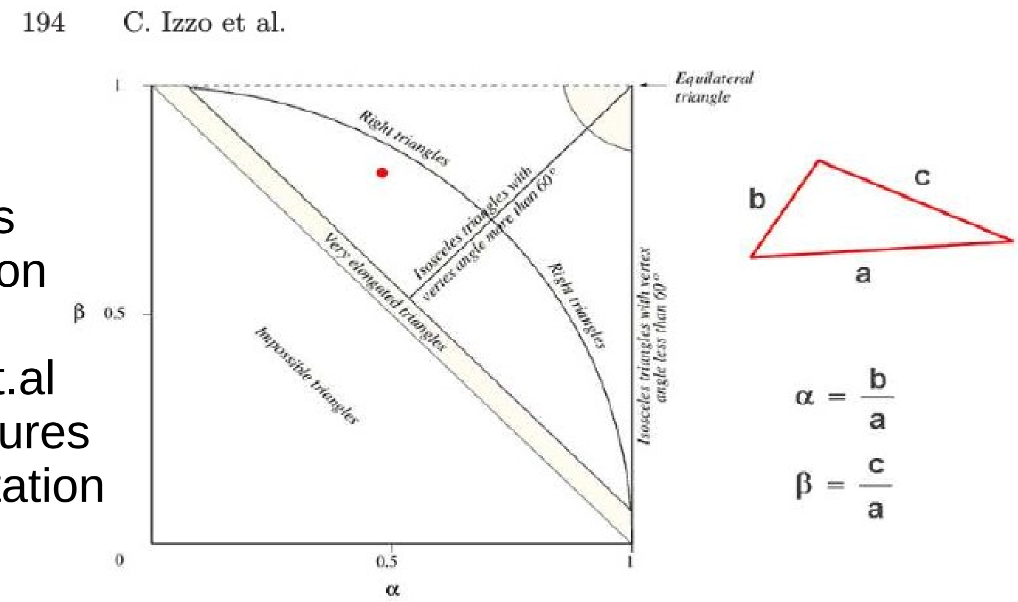
- average your bias frames
- average your dark frames
- average all flat-fields of the same setup
- correct the object frames for bias, overscan, and dark
- make sure that the dispersion direction in all your frames is along the x-axis

3.2 data reduction pipeline

- 1999 ESO-MIDAS based imaging/spectroscopy pipeline

- 2006 pipeline rewritten (Izzo C., et al. 2010.SPIE) for
  imaging: pattern matching using bottom-up approach
  (= from data to model), SourceExtractor, error propagation,
  flat field correction, least square fit of photometric equations

  MOS / MXU / LSS:
  arc line pattern matching,
  global distortion corrected,
  day-time arcs aligned to sky lines
  optimum extraction, flux calibration



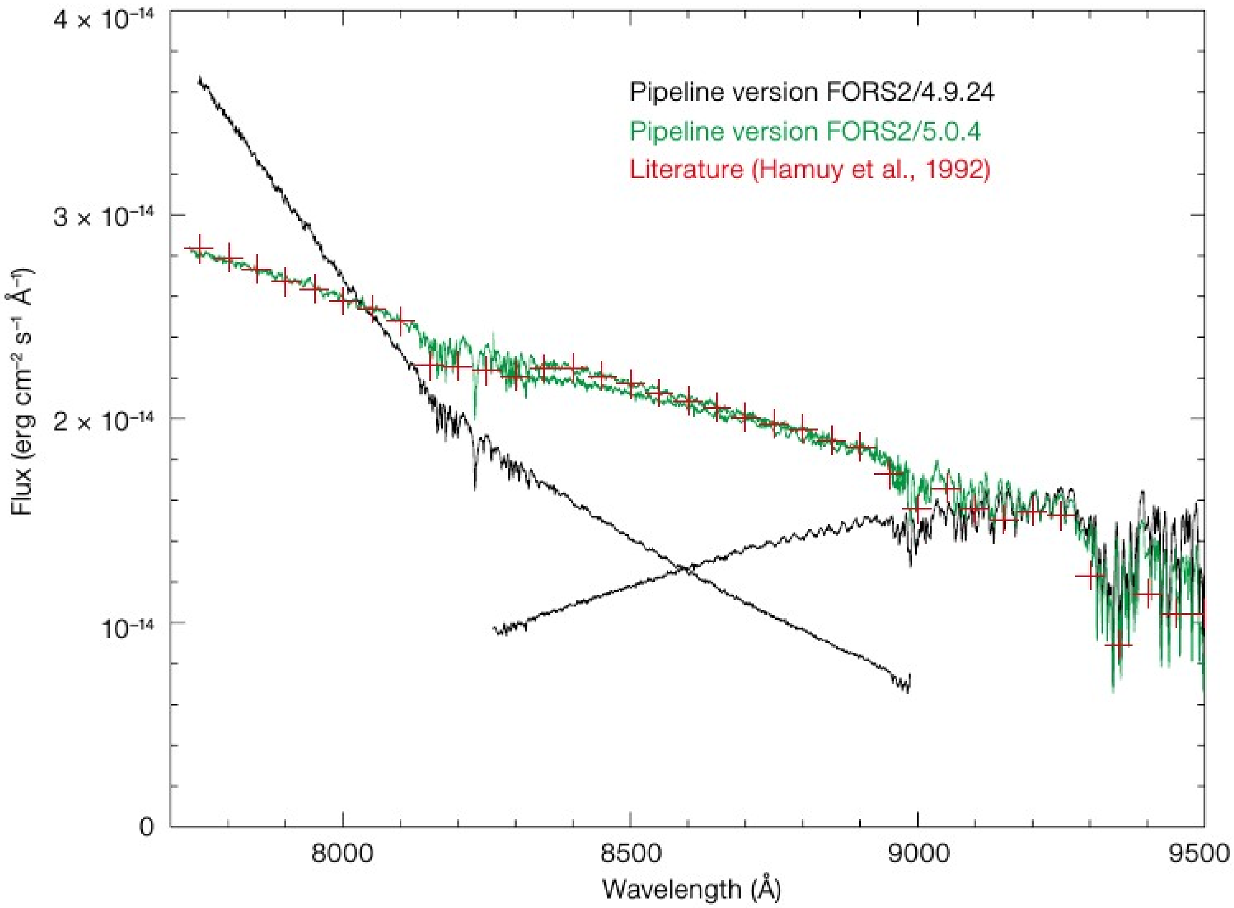
- 2009 PMOS support, (Bagnulo, S., et.al 2009,PASP 121), handles exposures with of different retarder plate rotation angles.
  linear and circular polarimetry supported.

3.2 data reduction pipeline

- 2015 VLT-ANR-ESO-13112-6270 (Moehler et. al.)

  - reflex workflow for spectroscopy (push one button)
  - bias level based on pre/over scan, 20 raw frames for a better RON and error propagation
  - revision of grism-specific parameters (grism tables): random error in WLC reduced from 0.15 to 0.12 pixel
  - spectroscopic flats normalized before stacking to compensate for blue flat lamp SED variations ~10% within the stack
  - investigated: spatial illumination of LSS data is very similar: screen flats, twilight flats, science data
  - spectral masking regions for stellar and telluric features included, when deriving the response function from Hamuy (50Ang binned) and observed flux std.
  - the VPH grism response varies with slit position.
    LSS: take 5'' flux std at position of the long slit
    MOS/MXU: divide off-center science and flux std by their own flat SED to construct sensitivity function.

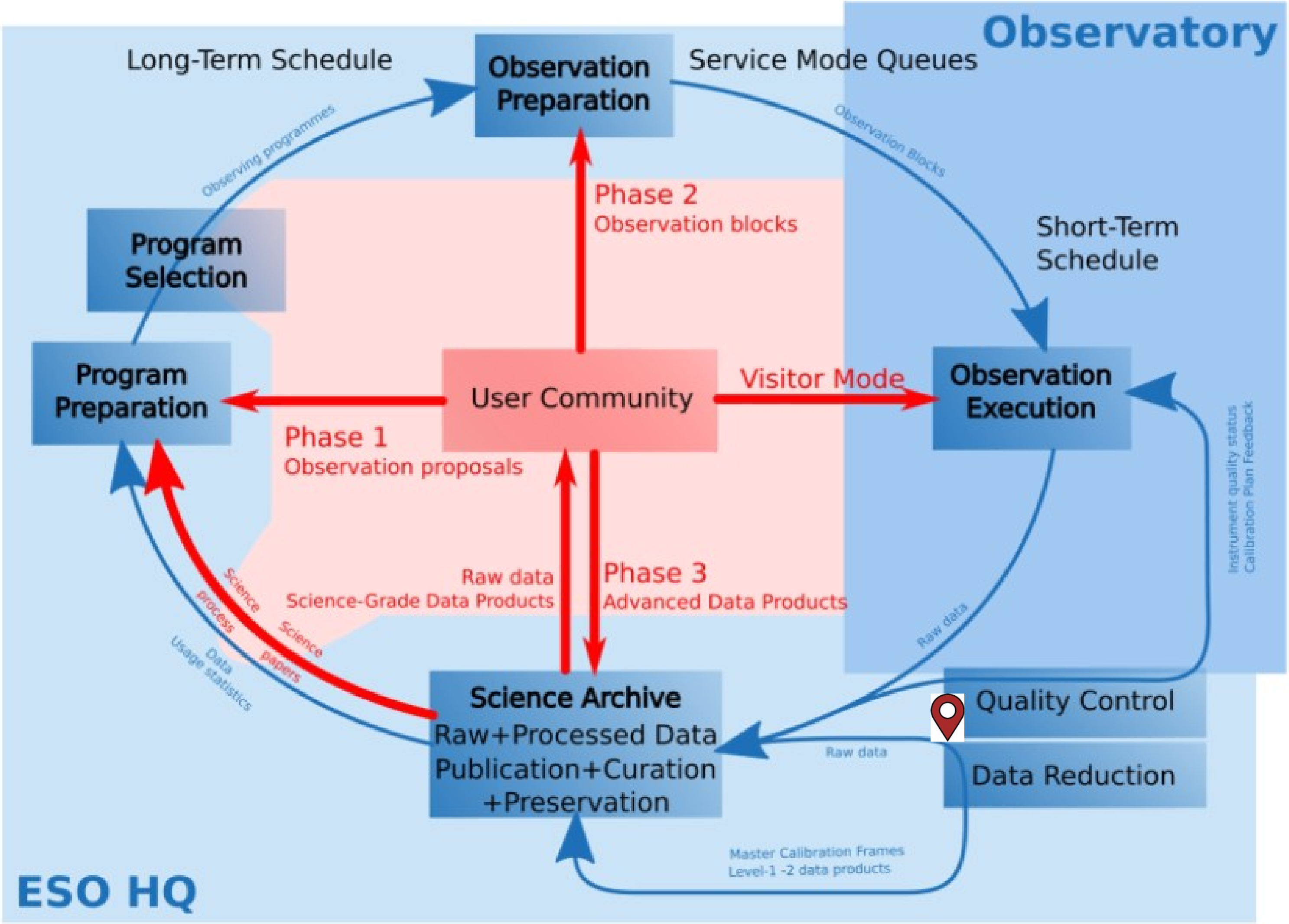
3.2 data reduction pipeline




JAN/25/2019

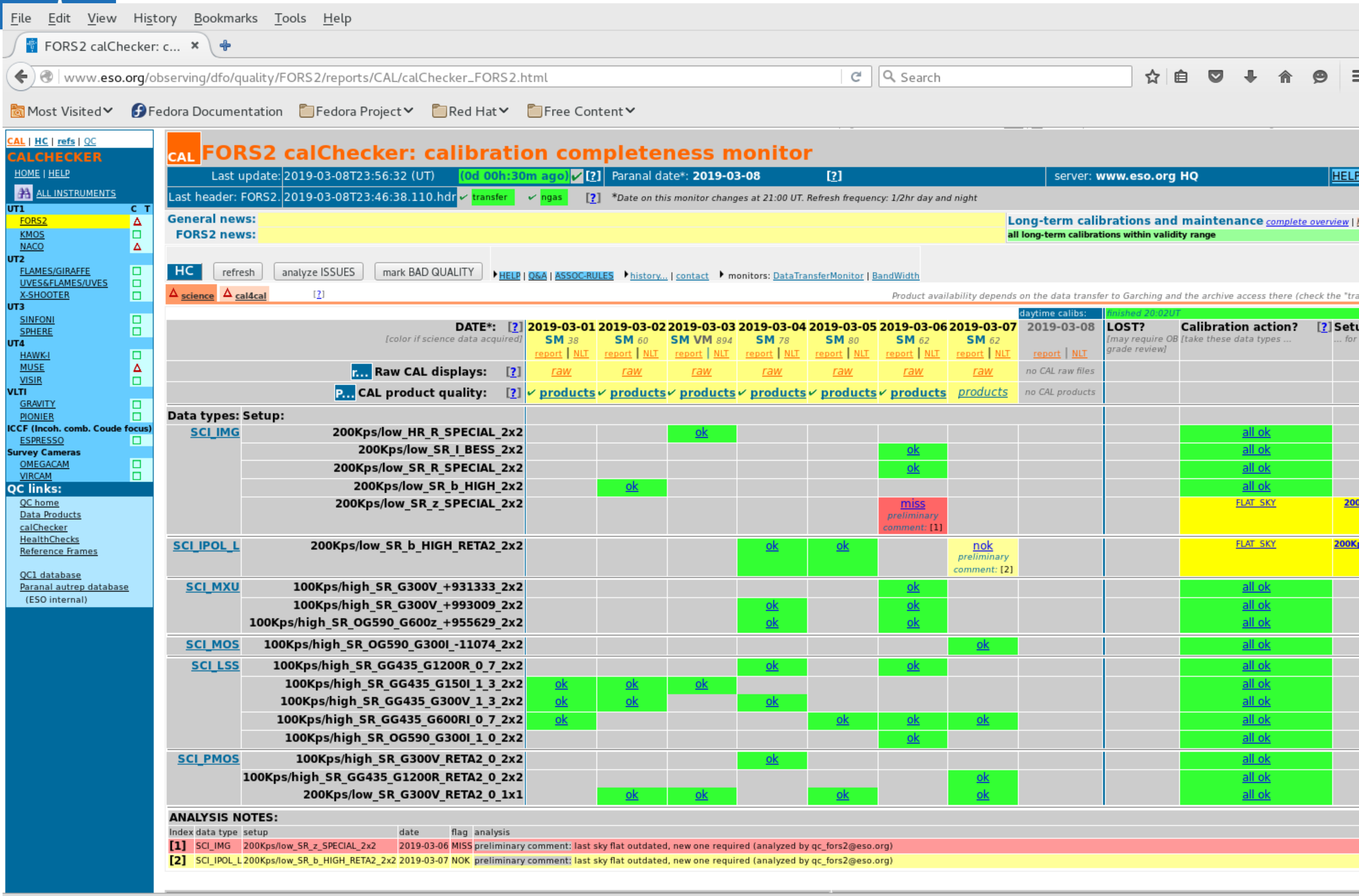
3.3 Data Processing and Quality Control

Data Flow System: today



DI

- FORS2 is operated within the VLT dataflow system
- Quality Control Group:
- Checking the completeness of calibrations (hourly)
- Processing all calibrations (except IPOL and HIT)
- Certify master calibrations, ingest them in the archive for public usage
- Extract Quality Control Parameters from pipeline products, continuous monitoring of the performance of the instrument, scoring system
- QC loop is closed hourly
- Maintain association rules



File Edit View History Bookmarks Tools Help

FORS2 calChecker: c...

www.eso.org/observing/dfo/quality/FORS2/reports/CAL/calChecker_FORS2.html

Most Visited | Fedora Documentation | Fedora Project | Red Hat | Free Content

CAL | HC | refs | QC

CALCHECKER

HOME | HELP

ALL INSTRUMENTS

UT1 C T: FORS2, KMOS, NACO
UT2: FLAMES/GIRAFFE, UVES&FLAMES/UVES, X-SHOOTER
UT3: SINFONI, SPHERE
UT4: HAWK-I, MUSE, VISIR
VLTI: GRAVITY, PIONIER
ICCF (Incoh. comb. Coude focus): ESPRESSO
Survey Cameras: OMEGACAM, VIRCAM

QC links: QC home, Data Products, calChecker, HealthChecks, Reference Frames, QC1 database, Paranal autrep database (ESO internal)

CAL FORS2 calChecker: calibration completeness monitor

Last update: 2019-03-08T23:56:32 (UT) (0d 00h:30m ago) [?] Paranal date*: 2019-03-08 [?] server: www.eso.org HQ HELP

Last header: FORS2.2019-03-08T23:46:38.110.hdr transfer ngas [?] *Date on this monitor changes at 21:00 UT. Refresh frequency: 1/2hr day and night

General news:

FORS2 news:

Long-term calibrations and maintenance complete overview | ho

all long-term calibrations within validity range

HC refresh analyze ISSUES mark BAD QUALITY HELP | Q&A | ASSOC-RULES history... | contact monitors: DataTransferMonitor | BandWidth

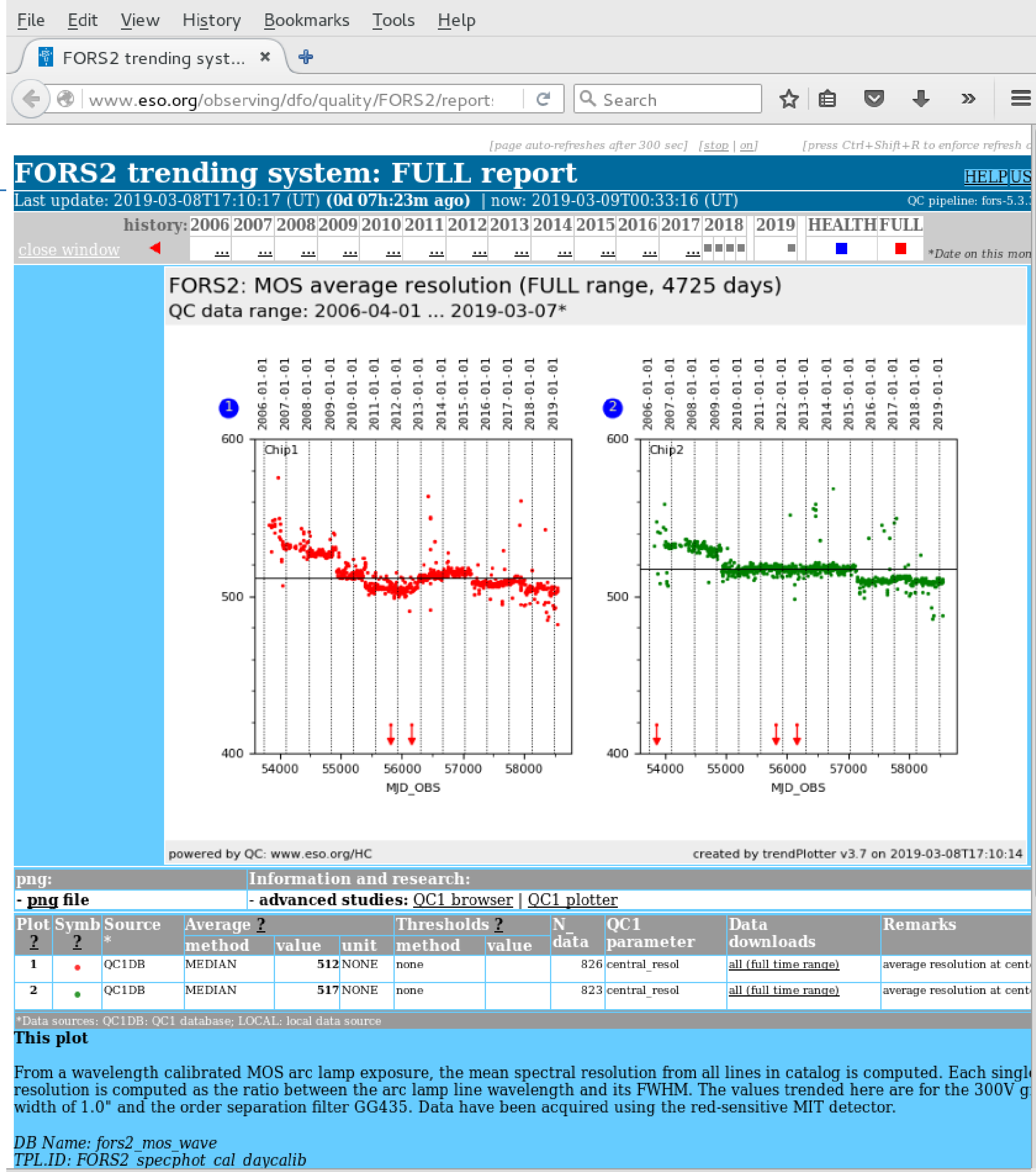
science cal4cal [?] Product availability depends on the data transfer to Garching and the archive access there (check the "tran

daytime calibs: finished 20:02UT

Data types:	Setup:	2019-03-01 SM 38 report | NLT	2019-03-02 SM 60 report | NLT	2019-03-03 SM VM 894 report | NLT	2019-03-04 SM 78 report | NLT	2019-03-05 SM 80 report | NLT	2019-03-06 SM 62 report | NLT	2019-03-07 SM 62 report | NLT	2019-03-08 report | NLT	LOST? [may require OB grade review]	Calibration action? [?] [take these data types ...	Setup ... for th
	DATE*: [?] [color if science data acquired]											
	r... Raw CAL displays: [?]	raw	raw	raw	raw	raw	raw	raw	no CAL raw files			
	P... CAL product quality: [?]	✓ products	✓ products	✓ products	✓ products	✓ products	✓ products	products	no CAL products			
SCI_IMG	200Kps/low_HR_R_SPECIAL_2x2			ok							all ok	
	200Kps/low_SR_I_BESS_2x2						ok				all ok	
	200Kps/low_SR_R_SPECIAL_2x2						ok				all ok	
	200Kps/low_SR_b_HIGH_2x2		ok								all ok	
	200Kps/low_SR_z_SPECIAL_2x2						miss preliminary comment: [1]				FLAT_SKY	200K
SCI_IPOL_L	200Kps/low_SR_b_HIGH_RETA2_2x2				ok	ok		nok preliminary comment: [2]			FLAT_SKY	200Kps
SCI_MXU	100Kps/high_SR_G300V_+931333_2x2						ok				all ok	
	100Kps/high_SR_G300V_+993009_2x2				ok		ok				all ok	
	100Kps/high_SR_OG590_G600z_+955629_2x2				ok		ok				all ok	
SCI_MOS	100Kps/high_SR_OG590_G300I_-11074_2x2							ok			all ok	
SCI_LSS	100Kps/high_SR_GG435_G1200R_0_7_2x2				ok		ok				all ok	
	100Kps/high_SR_GG435_G150I_1_3_2x2	ok	ok	ok							all ok	
	100Kps/high_SR_GG435_G300V_1_3_2x2	ok	ok		ok						all ok	
	100Kps/high_SR_GG435_G600RI_0_7_2x2	ok				ok	ok	ok			all ok	
	100Kps/high_SR_OG590_G300I_1_0_2x2						ok				all ok	
SCI_PMOS	100Kps/high_SR_G300V_RETA2_0_2x2				ok						all ok	
	100Kps/high_SR_GG435_G1200R_RETA2_0_2x2							ok			all ok	
	200Kps/low_SR_G300V_RETA2_0_1x1		ok	ok		ok		ok			all ok	

ANALYSIS NOTES:

Index	data type	setup	date	flag	analysis
[1]	SCI_IMG	200Kps/low_SR_z_SPECIAL_2x2	2019-03-06	MISS	preliminary comment: last sky flat outdated, new one required (analyzed by qc_fors2@eso.org)
[2]	SCI_IPOL_L	200Kps/low_SR_b_HIGH_RETA2_2x2	2019-03-07	NOK	preliminary comment: last sky flat outdated, new one required (analyzed by qc_fors2@eso.org)


File Edit View History Bookmarks Tools Help

FORS2 trending syst...

www.eso.org/observing/dfo/quality/FORS2/report:

[page auto-refreshes after 300 sec] [stop | on] [press Ctrl+Shift+R to enforce refresh

FORS2 trending system: FULL report

HELP US

Last update: 2019-03-08T17:10:17 (UT) **(0d 07h:23m ago)** | now: 2019-03-09T00:33:16 (UT) QC pipeline: fors-5.3.

history: 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 HEALTH FULL

close window *Date on this mon

FORS2: MOS average resolution (FULL range, 4725 days)

QC data range: 2006-04-01 ... 2019-03-07*

powered by QC: www.eso.org/HC created by trendPlotter v3.7 on 2019-03-08T17:10:14

png:	Information and research:
- **png file**	- **advanced studies:** QC1 browser | QC1 plotter

Plot ?	Symb ?	Source *	Average ? method	value	unit	Thresholds ? method	value	N_ data	QC1 parameter	Data downloads	Remarks
1	•	QC1DB	MEDIAN	512	NONE	none		826	central_resol	all (full time range)	average resolution at cent
2	•	QC1DB	MEDIAN	517	NONE	none		823	central_resol	all (full time range)	average resolution at cent

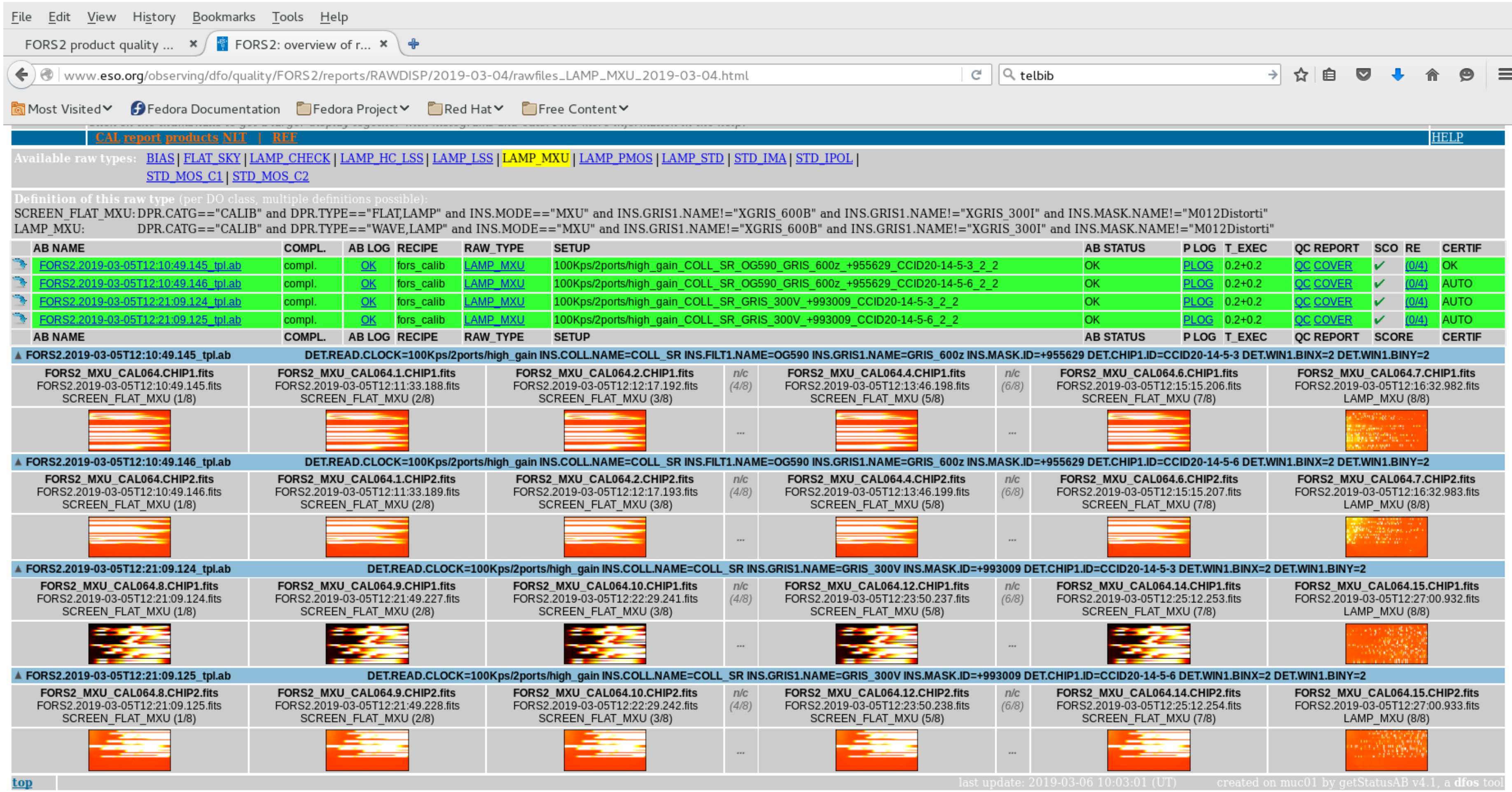
*Data sources: QC1DB: QC1 database; LOCAL: local data source

This plot

From a wavelength calibrated MOS arc lamp exposure, the mean spectral resolution from all lines in catalog is computed. Each singl resolution is computed as the ratio between the arc lamp line wavelength and its FWHM. The values trended here are for the 300V g width of 1.0" and the order separation filter GG435. Data have been acquired using the red-sensitive MIT detector.

DB Name: fors2_mos_wave

TPL.ID: FORS2_specphot_cal_daycalib



File Edit View History Bookmarks Tools Help

FORS2 product quality ... | FORS2: overview of r...

www.eso.org/observing/dfo/quality/FORS2/reports/RAWDISP/2019-03-04/rawfiles_LAMP_MXU_2019-03-04.html

telbib

Most Visited | Fedora Documentation | Fedora Project | Red Hat | Free Content

CAL report products NLT | REF — HELP

Available raw types: BIAS | FLAT_SKY | LAMP_CHECK | LAMP_HC_LSS | LAMP_LSS | LAMP_MXU | LAMP_PMOS | LAMP_STD | STD_IMA | STD_IPOL | STD_MOS_C1 | STD_MOS_C2

Definition of this raw type (per DO class, multiple definitions possible):

SCREEN_FLAT_MXU: DPR.CATG=="CALIB" and DPR.TYPE=="FLAT,LAMP" and INS.MODE=="MXU" and INS.GRIS1.NAME!="XGRIS_600B" and INS.GRIS1.NAME!="XGRIS_300I" and INS.MASK.NAME!="M012Distorti"

LAMP_MXU: DPR.CATG=="CALIB" and DPR.TYPE=="WAVE,LAMP" and INS.MODE=="MXU" and INS.GRIS1.NAME!="XGRIS_600B" and INS.GRIS1.NAME!="XGRIS_300I" and INS.MASK.NAME!="M012Distorti"

AB NAME	COMPL.	AB LOG	RECIPE	RAW_TYPE	SETUP	AB STATUS	P LOG	T_EXEC	QC REPORT	SCO	RE	CERTIF
FORS2.2019-03-05T12:10:49.145_tpl.ab	compl.	OK	fors_calib	LAMP_MXU	100Kps/2ports/high_gain_COLL_SR_OG590_GRIS_600z_+955629_CCID20-14-5-3_2_2	OK	PLOG	0.2+0.2	QC COVER	✓	(0/4)	OK
FORS2.2019-03-05T12:10:49.146_tpl.ab	compl.	OK	fors_calib	LAMP_MXU	100Kps/2ports/high_gain_COLL_SR_OG590_GRIS_600z_+955629_CCID20-14-5-6_2_2	OK	PLOG	0.2+0.2	QC COVER	✓	(0/4)	AUTO
FORS2.2019-03-05T12:21:09.124_tpl.ab	compl.	OK	fors_calib	LAMP_MXU	100Kps/2ports/high_gain_COLL_SR_GRIS_300V_+993009_CCID20-14-5-3_2_2	OK	PLOG	0.2+0.2	QC COVER	✓	(0/4)	AUTO
FORS2.2019-03-05T12:21:09.125_tpl.ab	compl.	OK	fors_calib	LAMP_MXU	100Kps/2ports/high_gain_COLL_SR_GRIS_300V_+993009_CCID20-14-5-6_2_2	OK	PLOG	0.2+0.2	QC COVER	✓	(0/4)	AUTO
AB NAME	COMPL.	AB LOG	RECIPE	RAW_TYPE	SETUP	AB STATUS	P LOG	T_EXEC	QC REPORT	SCORE		CERTIF

▲ FORS2.2019-03-05T12:10:49.145_tpl.ab — DET.READ.CLOCK=100Kps/2ports/high_gain INS.COLL.NAME=COLL_SR INS.FILT1.NAME=OG590 INS.GRIS1.NAME=GRIS_600z INS.MASK.ID=+955629 DET.CHIP1.ID=CCID20-14-5-3 DET.WIN1.BINX=2 DET.WIN1.BINY=2

FORS2_MXU_CAL064.CHIP1.fits FORS2.2019-03-05T12:10:49.145.fits SCREEN_FLAT_MXU (1/8)	FORS2_MXU_CAL064.1.CHIP1.fits FORS2.2019-03-05T12:11:33.188.fits SCREEN_FLAT_MXU (2/8)	FORS2_MXU_CAL064.2.CHIP1.fits FORS2.2019-03-05T12:12:17.192.fits SCREEN_FLAT_MXU (3/8)	n/c (4/8)	FORS2_MXU_CAL064.4.CHIP1.fits FORS2.2019-03-05T12:13:46.198.fits SCREEN_FLAT_MXU (5/8)	n/c (6/8)	FORS2_MXU_CAL064.6.CHIP1.fits FORS2.2019-03-05T12:15:15.206.fits SCREEN_FLAT_MXU (7/8)	FORS2_MXU_CAL064.7.CHIP1.fits FORS2.2019-03-05T12:16:32.982.fits LAMP_MXU (8/8)
			...		...		

▲ FORS2.2019-03-05T12:10:49.146_tpl.ab — DET.READ.CLOCK=100Kps/2ports/high_gain INS.COLL.NAME=COLL_SR INS.FILT1.NAME=OG590 INS.GRIS1.NAME=GRIS_600z INS.MASK.ID=+955629 DET.CHIP1.ID=CCID20-14-5-6 DET.WIN1.BINX=2 DET.WIN1.BINY=2

FORS2_MXU_CAL064.CHIP2.fits FORS2.2019-03-05T12:10:49.146.fits SCREEN_FLAT_MXU (1/8)	FORS2_MXU_CAL064.1.CHIP2.fits FORS2.2019-03-05T12:11:33.189.fits SCREEN_FLAT_MXU (2/8)	FORS2_MXU_CAL064.2.CHIP2.fits FORS2.2019-03-05T12:12:17.193.fits SCREEN_FLAT_MXU (3/8)	n/c (4/8)	FORS2_MXU_CAL064.4.CHIP2.fits FORS2.2019-03-05T12:13:46.199.fits SCREEN_FLAT_MXU (5/8)	n/c (6/8)	FORS2_MXU_CAL064.6.CHIP2.fits FORS2.2019-03-05T12:15:15.207.fits SCREEN_FLAT_MXU (7/8)	FORS2_MXU_CAL064.7.CHIP2.fits FORS2.2019-03-05T12:16:32.983.fits LAMP_MXU (8/8)
			...		...		

▲ FORS2.2019-03-05T12:21:09.124_tpl.ab — DET.READ.CLOCK=100Kps/2ports/high_gain INS.COLL.NAME=COLL_SR INS.GRIS1.NAME=GRIS_300V INS.MASK.ID=+993009 DET.CHIP1.ID=CCID20-14-5-3 DET.WIN1.BINX=2 DET.WIN1.BINY=2

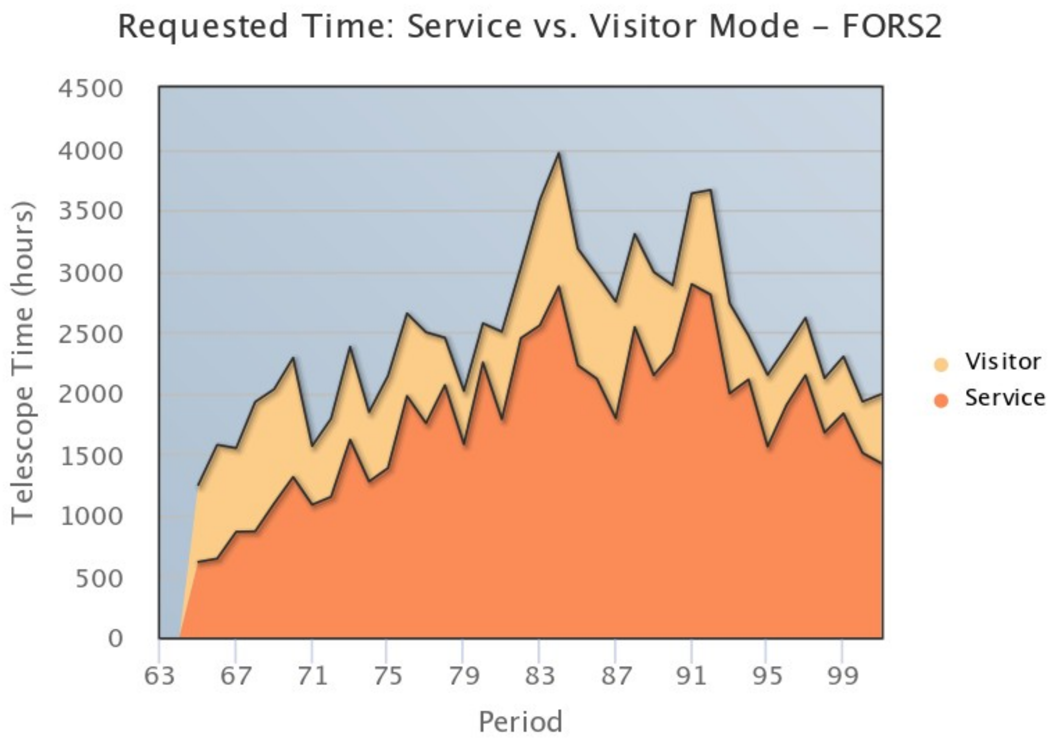
FORS2_MXU_CAL064.8.CHIP1.fits FORS2.2019-03-05T12:21:09.124.fits SCREEN_FLAT_MXU (1/8)	FORS2_MXU_CAL064.9.CHIP1.fits FORS2.2019-03-05T12:21:49.227.fits SCREEN_FLAT_MXU (2/8)	FORS2_MXU_CAL064.10.CHIP1.fits FORS2.2019-03-05T12:22:29.241.fits SCREEN_FLAT_MXU (3/8)	n/c (4/8)	FORS2_MXU_CAL064.12.CHIP1.fits FORS2.2019-03-05T12:23:50.237.fits SCREEN_FLAT_MXU (5/8)	n/c (6/8)	FORS2_MXU_CAL064.14.CHIP1.fits FORS2.2019-03-05T12:25:12.253.fits SCREEN_FLAT_MXU (7/8)	FORS2_MXU_CAL064.15.CHIP1.fits FORS2.2019-03-05T12:27:00.932.fits LAMP_MXU (8/8)
			...		...		

▲ FORS2.2019-03-05T12:21:09.125_tpl.ab — DET.READ.CLOCK=100Kps/2ports/high_gain INS.COLL.NAME=COLL_SR INS.GRIS1.NAME=GRIS_300V INS.MASK.ID=+993009 DET.CHIP1.ID=CCID20-14-5-6 DET.WIN1.BINX=2 DET.WIN1.BINY=2

FORS2_MXU_CAL064.8.CHIP2.fits FORS2.2019-03-05T12:21:09.125.fits SCREEN_FLAT_MXU (1/8)	FORS2_MXU_CAL064.9.CHIP2.fits FORS2.2019-03-05T12:21:49.228.fits SCREEN_FLAT_MXU (2/8)	FORS2_MXU_CAL064.10.CHIP2.fits FORS2.2019-03-05T12:22:29.242.fits SCREEN_FLAT_MXU (3/8)	n/c (4/8)	FORS2_MXU_CAL064.12.CHIP2.fits FORS2.2019-03-05T12:23:50.238.fits SCREEN_FLAT_MXU (5/8)	n/c (6/8)	FORS2_MXU_CAL064.14.CHIP2.fits FORS2.2019-03-05T12:25:12.254.fits SCREEN_FLAT_MXU (7/8)	FORS2_MXU_CAL064.15.CHIP2.fits FORS2.2019-03-05T12:27:00.933.fits LAMP_MXU (8/8)
			...		...		

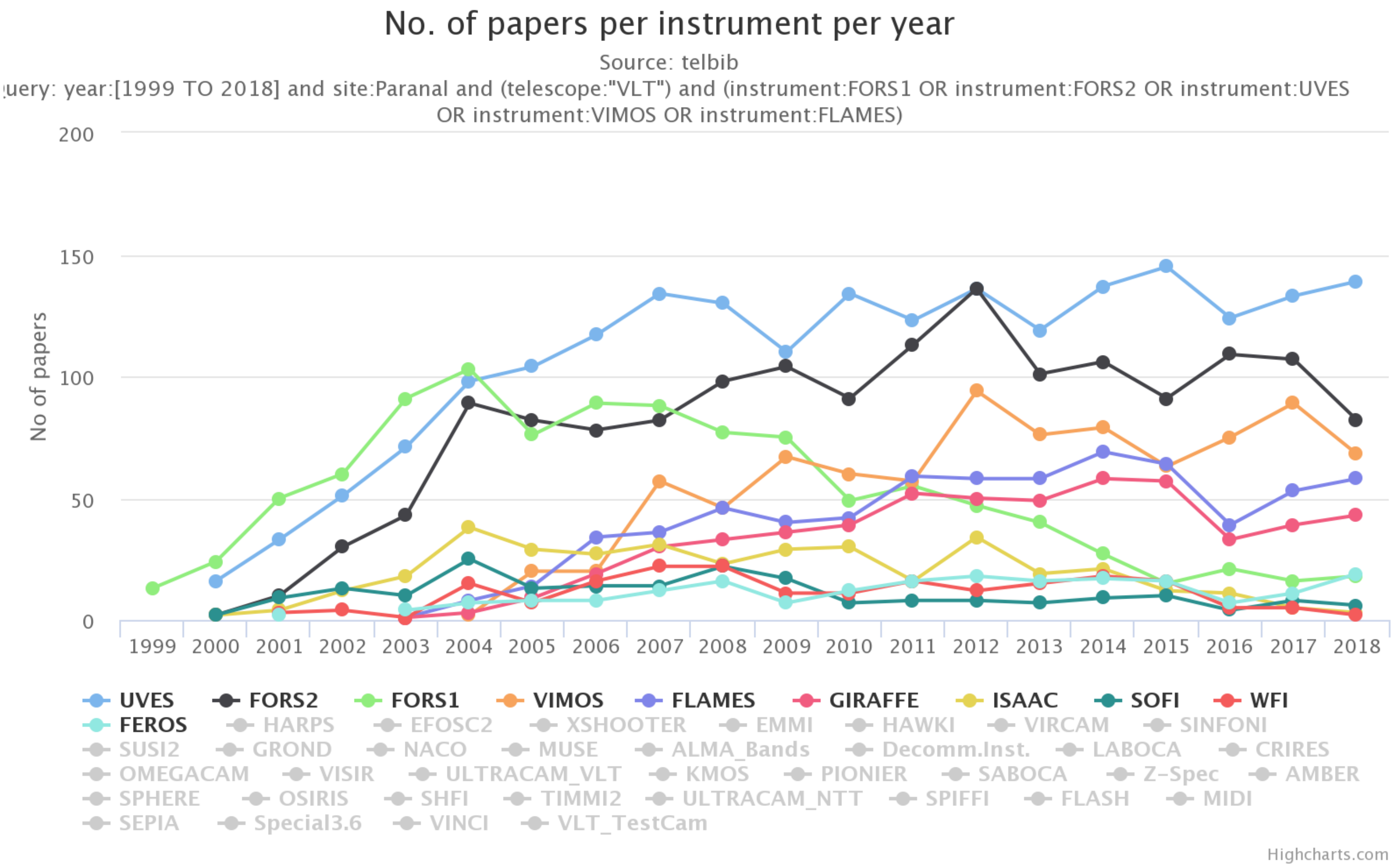
top — last update: 2019-03-06 10:03:01 (UT) — created on muc01 by getStatusAB v4.1, a **dfos** tool

Statistics

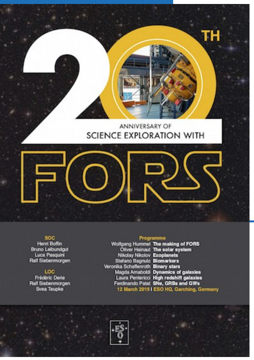

Requested Time: Service vs. Visitor Mode – FORS2
Telescope Time (hours)
4500
4000
3500
3000
2500
2000
1500
1000
500
0
63
67
71
75
79
83
87
91
95
99
Period
Visitor
Service

ESO Annual Report 2017: requested time , pressure

Telescope	Instrument	Requested runs	Scheduled runs	Requested time	%	Scheduled time	%	Pressure	Total allocation	%
UT1	NACO	75	35	70	11.8%	19	15.8%	3.7	55	24.8%
	FORS2	345	101	376	63.9%	88	73.7%	4.3	109	49.3%
	KMOS	74	10	143	24.2%	13	10.6%	11.3	57	26.0%
Total		494	146	588		119		4.9	221	
UT2	FLAMES	88	17	145	15.5%	29	14.7%	5.0	49	21.2%
	UVES	206	45	298	32.0%	46	23.0%	6.5	53	22.8%
	X-SHOOTER	376	122	489	52.5%	124	62.3%	4.0	130	56.0%
Total		670	184	931		199		4.7	233	
UT3	SPHERE	219	104	220	60.3%	55	59.8%	4.0	118	47.3%
	VIMOS	21	13	33	9.0%	1	1.4%	25.1	85	34.2%
	VISIR	94	45	112	30.7%	35	38.8%	3.2	46	18.5%
Total		334	162	364		91		4.0	248	
UT4	SINFONI	146	22	177	26.5%	29	36.8%	6.0	48	32.8%
	MUSE	369	41	419	62.6%	42	52.3%	10.0	87	59.5%
	HAWK-I	86	17	72	10.8%	9	10.9%	8.3	11	7.8%
Total		601	80	669		80		8.4	147	



No. of papers per instrument per year
Source: telbib
uery: year:[1999 TO 2018] and site:Paranal and (telescope:"VLT") and (instrument:FORS1 OR instrument:FORS2 OR instrument:UVES OR instrument:VIMOS OR instrument:FLAMES)
No of papers
200
150
100
50
0
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
UVES
FORS2
FORS1
VIMOS
FLAMES
GIRAFFE
ISAAC
SOFI
WFI
FEROS
HARPS
EFOSC2
XSHOOTER
EMMI
HAWKI
VIRCAM
SINFONI
SUSI2
GROND
NACO
MUSE
ALMA_Bands
Decomm.Inst.
LABOCA
CRIRES
OMEGACAM
VISIR
ULTRACAM_VLT
KMOS
PIONIER
SABOCA
Z-Spec
AMBER
SPHERE
OSIRIS
SHFI
TIMMI2
ULTRACAM_NTT
SPIFFI
FLASH
MIDI
SEPIA
Special3.6
VINCI
VLT_TestCam
Highcharts.com



Summary




- Overview of what ESO and the community has provided to

  support day-to-day operations of the instrument

  maintain and keep it competitive

  investigate problems and improve the instrument

  higher quality of astronomical data.

  ~ 50% of ESO staff once contributed to one of the FORSes

  For the beautiful science of which we will hear in the next talks.