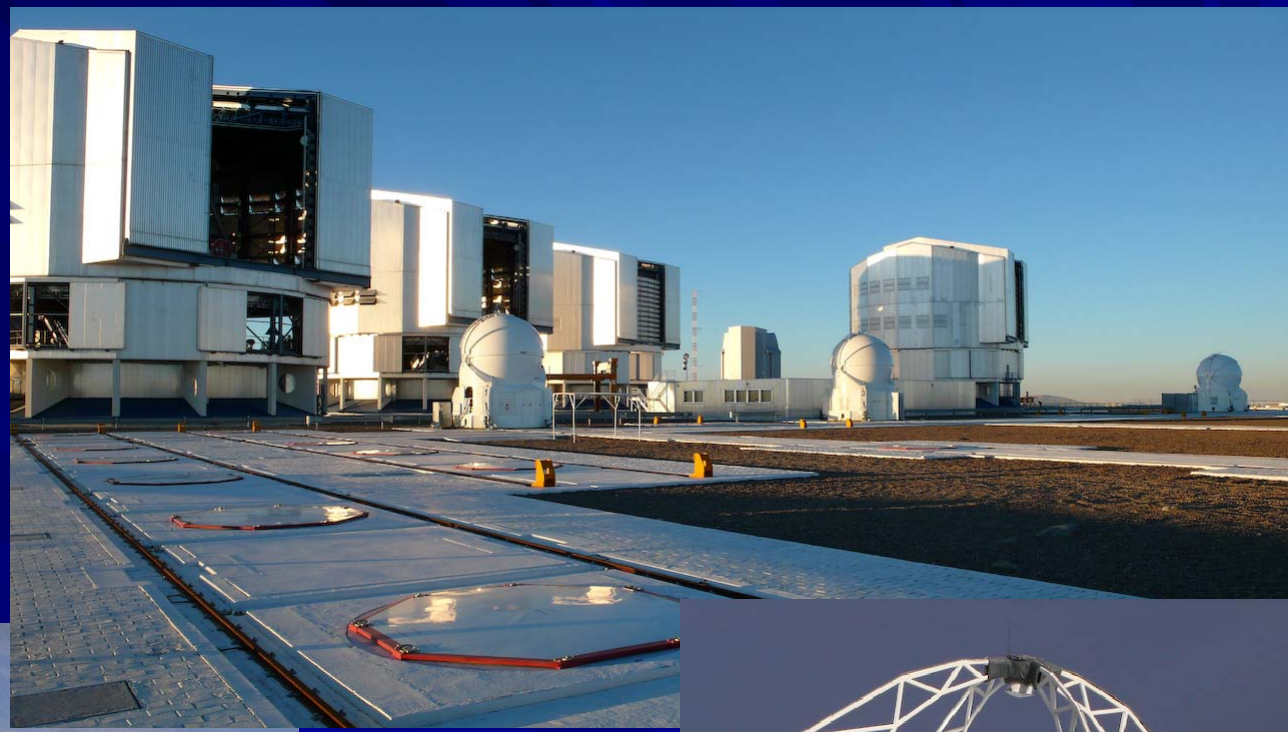
Instrument Calibration at the La Silla Paranal Observatory

The 2007 ESO Instrument Calibration Workshop
Garching, January 23-26, 2007

G. Marconi

La Silla Paranal Observatory

4 UTs
4 ATs



3.6 m
NTT

2.2 m

APEX

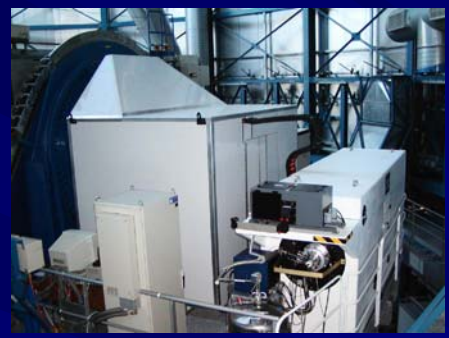
Paranal: 12 Operational VLT(I) Instruments

ANTU

ISAAC

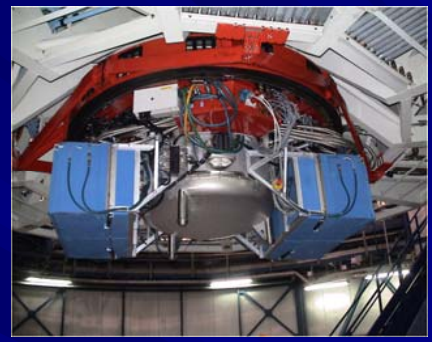
KUEYEN

FLAMES



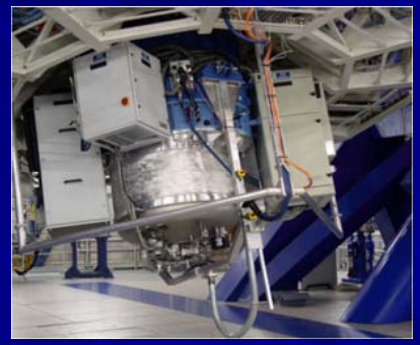
MELIPAL

VISIR

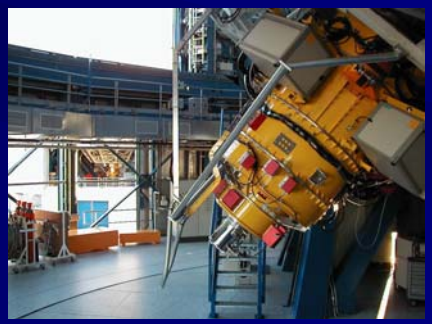


YEPUN

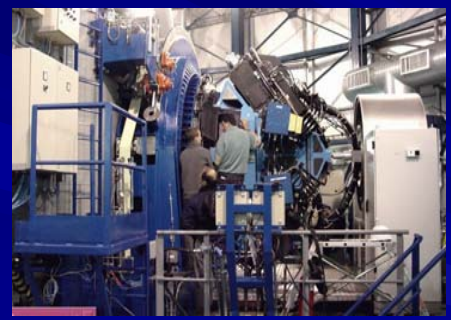
SINFONI



FORS 2 & 1 UVES



VIMOS



NACO

CRIRES

MIDI

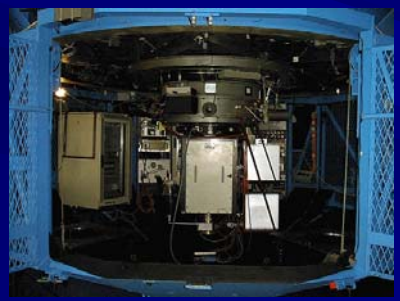
AMBER

La Silla: 8 Operational Instruments

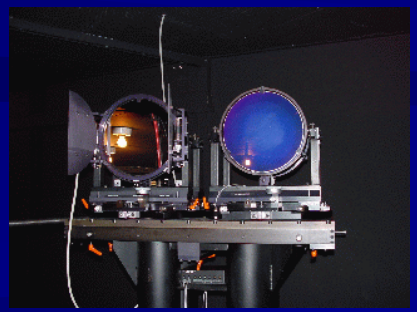
3.6m

HARPS

EFOSC2



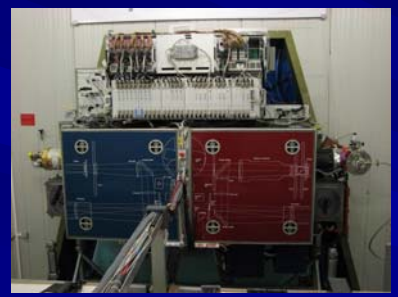
CES



NTT

SOFI

EMMI

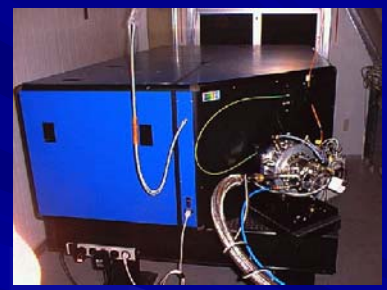


SUSI2

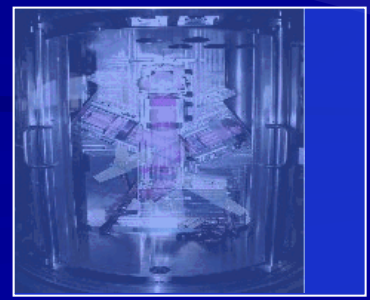
2.2m

WFI

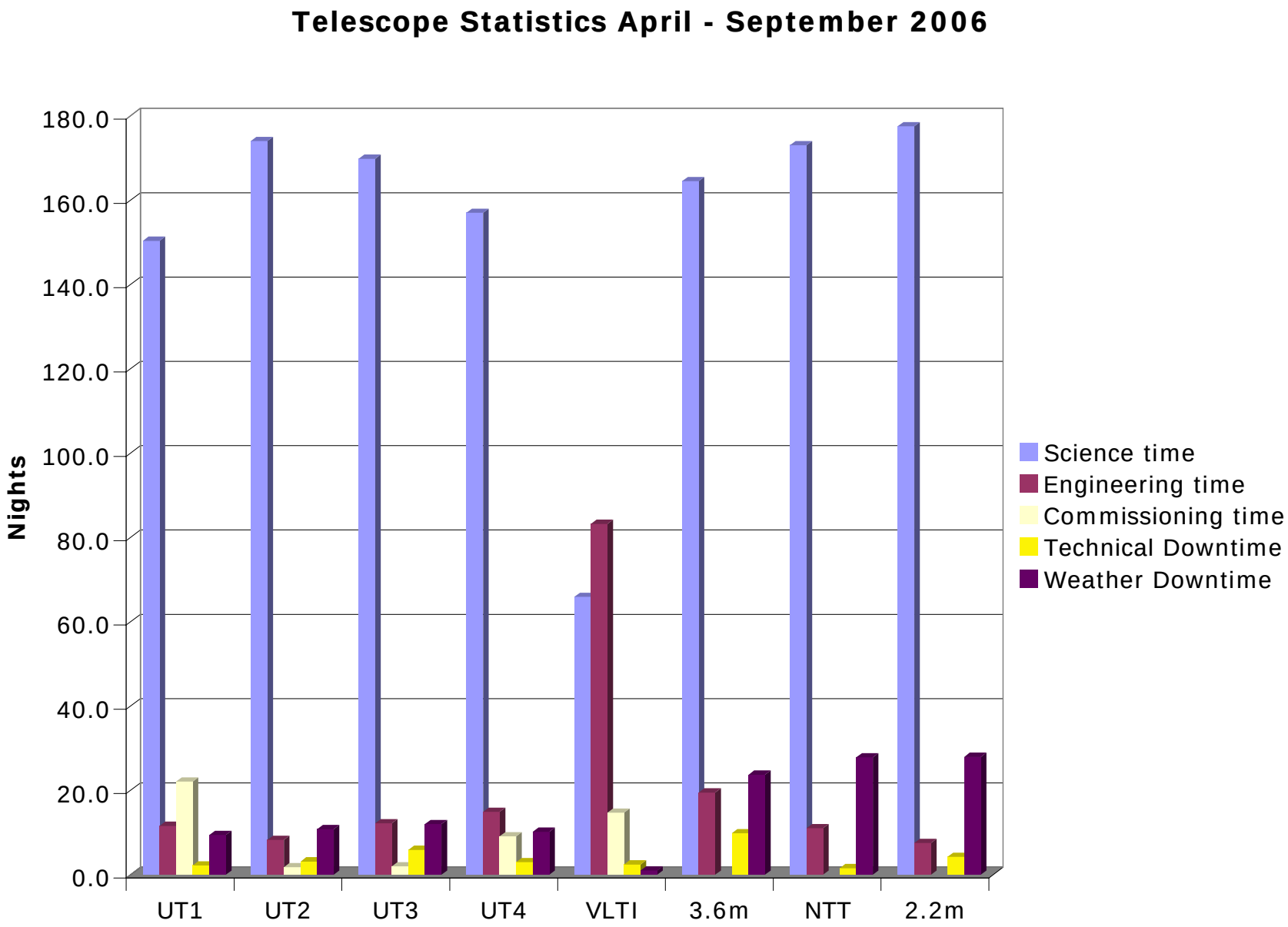
FEROS



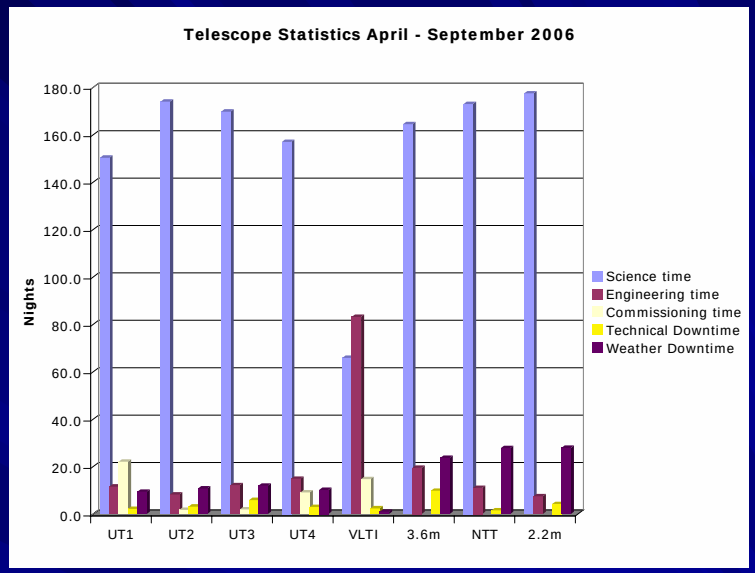
GROND



Telescope Statistics



Telescope Statistics



Science Availability

- Paranal UTs 88.8%
- VLTI (UTs + ATs) 40.2%
- La Silla 93.1%

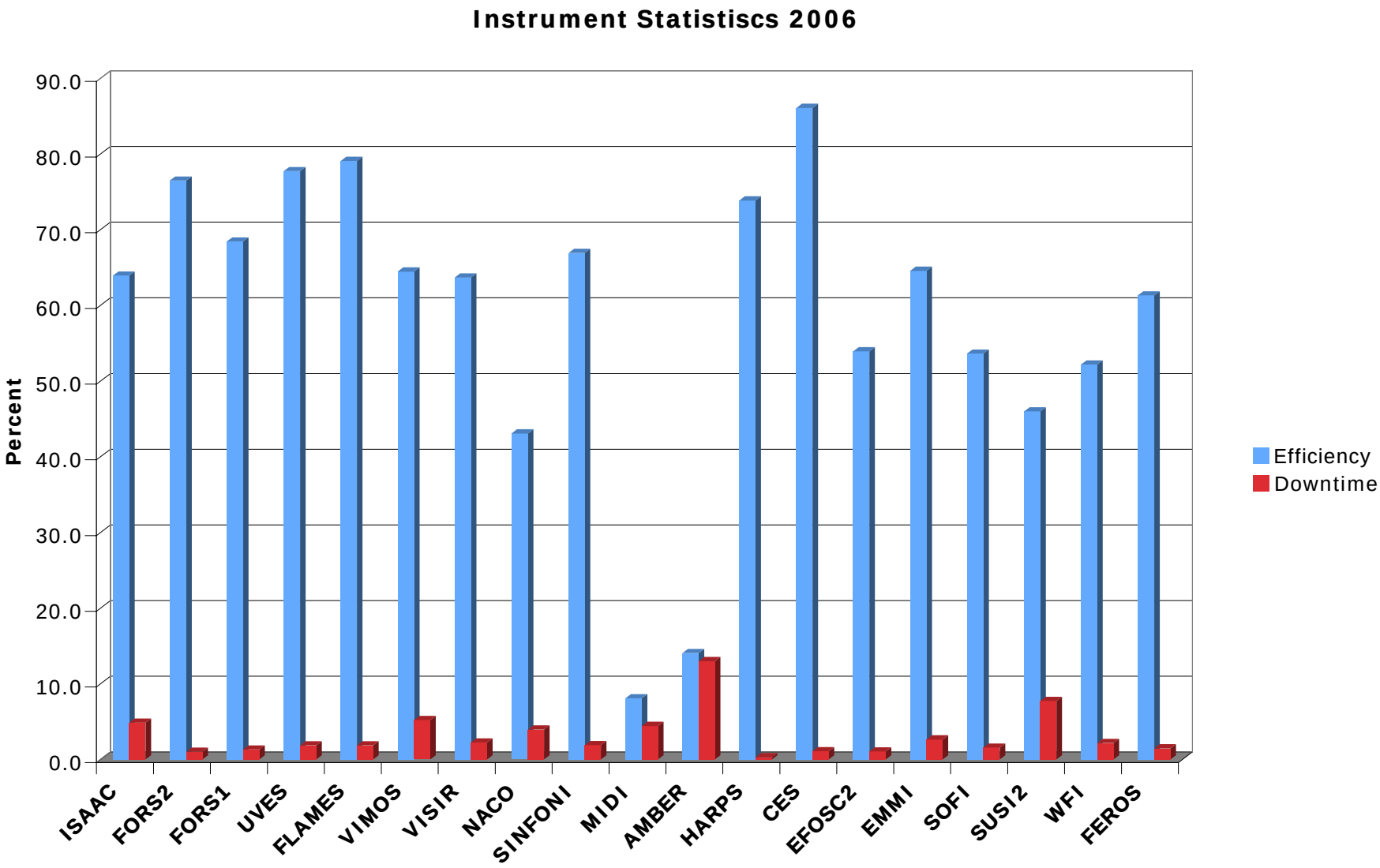
Technical Downtime

- Paranal 2.2%
- La Silla 3.1%

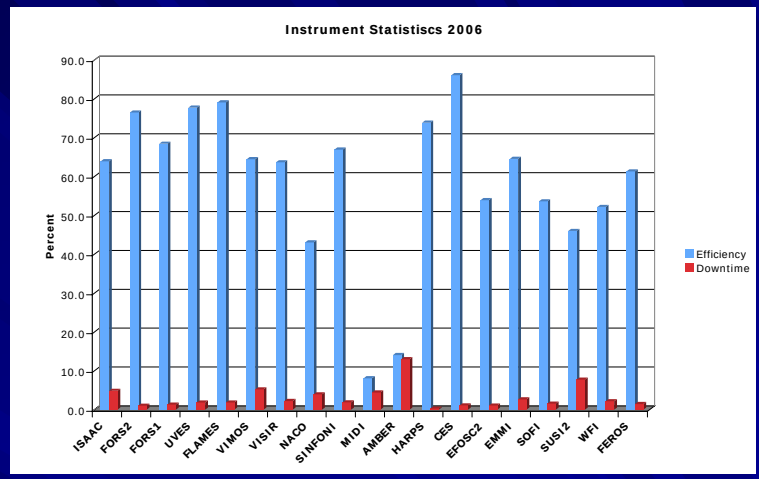
Weather Downtime

- Paranal 6.5%
- La Silla 15.4%

Instrument Statistics



Instrument Statistics



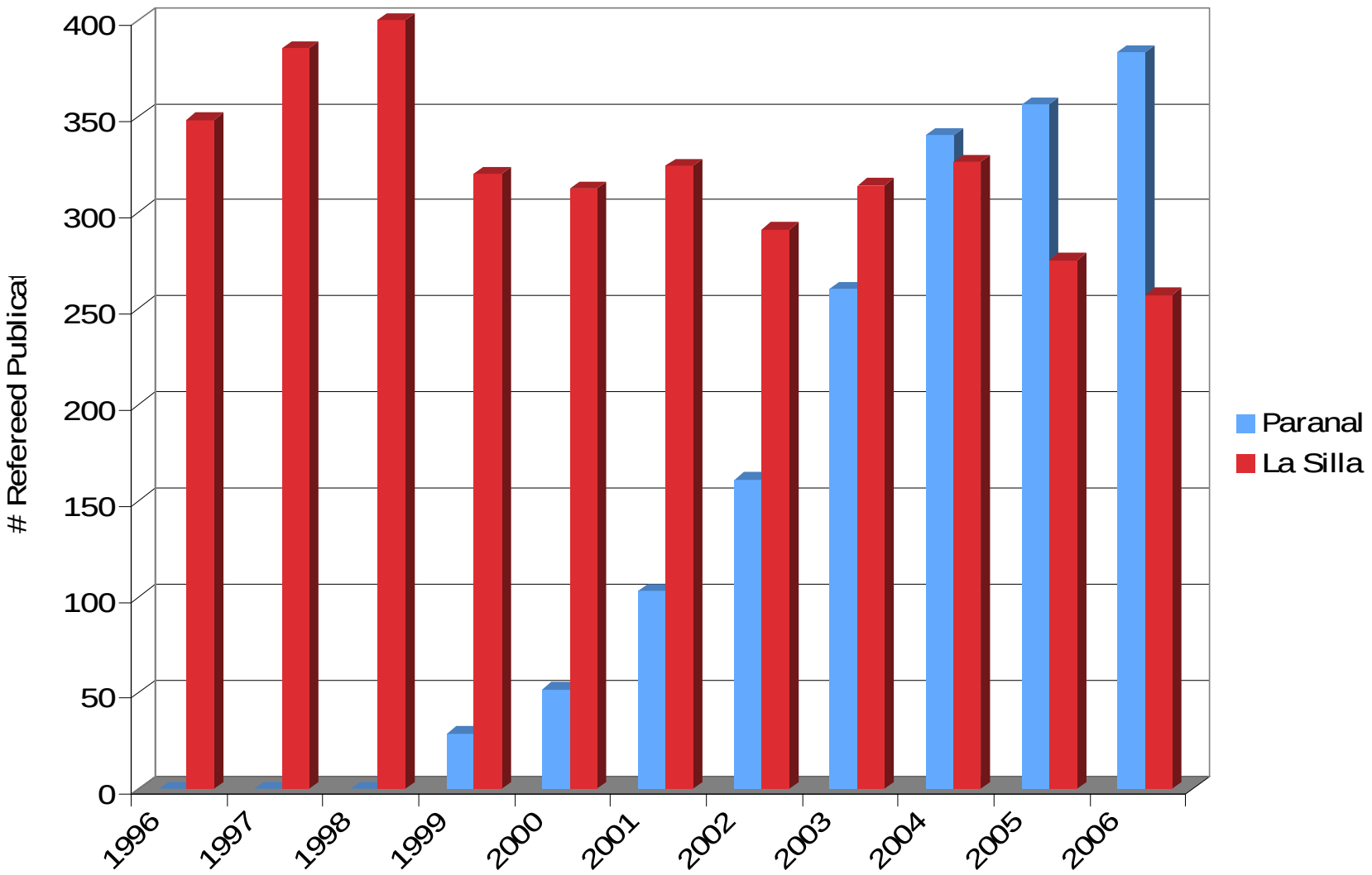
Average Shutter Efficiency

- UT Instruments 67.1%
- VLTI Instruments 11.1%
- La Silla Instruments 61.4%

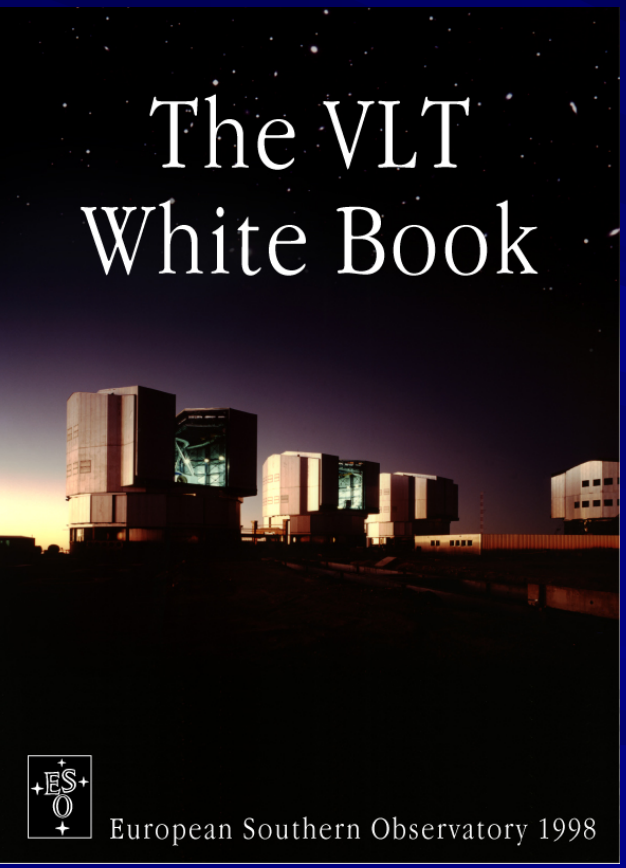
Average Technical Downtime

- UT Instruments 2.7%
- VLTI Instruments 8.7%
- La Silla Instruments 2.2%

Publication Statistics



Instrument Calibration at the La Silla Paranal Observatory



The VLT must be operated in a manner that will result in the **greatest scientific return**

VLT instruments should be **continuously calibrated and monitored** to ensure the accuracy of calibration and the long term performance of the instruments

Data from the VLT should be delivered to astronomers in raw and processed forms so that data analysis overheads are diminished and scientific assessment of data is accelerated

The global requirement is to **maximize the scientific return of the VLT**

For all supported instrument modes, an associated **calibration plan** will be developed. This plan will be executed automatically and produce calibration data that will ensure the long term usefulness of the raw science data. Calibration plan data will enable ESO to monitor instrument performance and long term trends in instrument and telescope behavior

VLT operations will produce **quality-controlled science data** that combines raw and calibration frames into final data products that contain physical as well as instrumental units.

Instrument Calibration at the La Silla Paranal Observatory

5.10 Summary: Science Data Calibrations

To be distributed in the UVES User Manual:

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

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

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

Instrument Calibration at the La Silla Paranal Observatory

Who is doing what?

The night calibrations are done following the CalPlan by the Night Astronomers accordingly to the requirements of the executed science.

The day calibrations are automatically created by a tool “CalobBuild” , according to the CalPlan and for all the setup modes used during an observing night

Who is checking what?

Shared QC ► SciOps/DFO

NAs and DAs are responsible of the first assessment of the acquired calibrations.

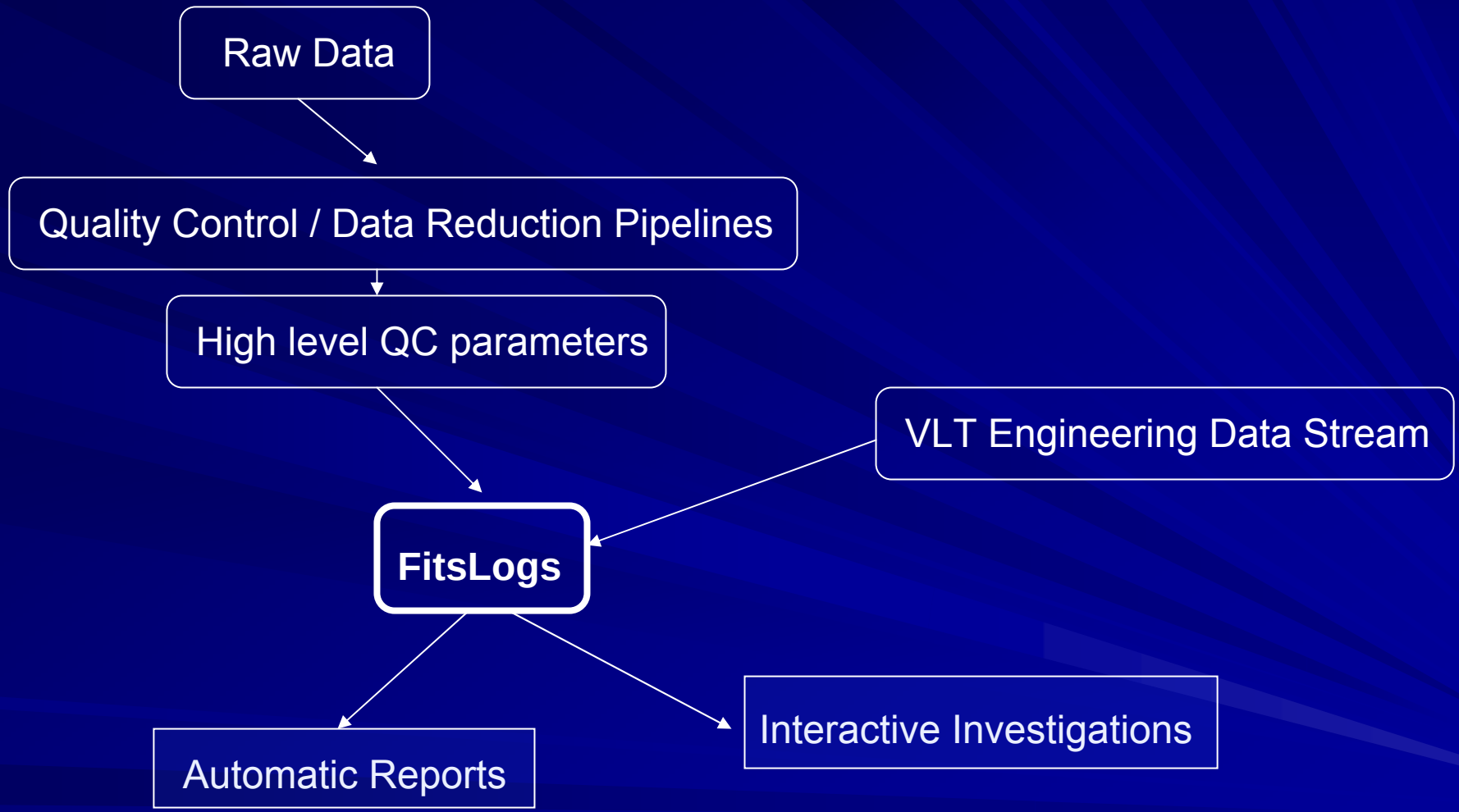
On-line: visual inspection of raw and reduced data comparison with reference database

Health check QC parameters

Off-line QC > trending (DFO)

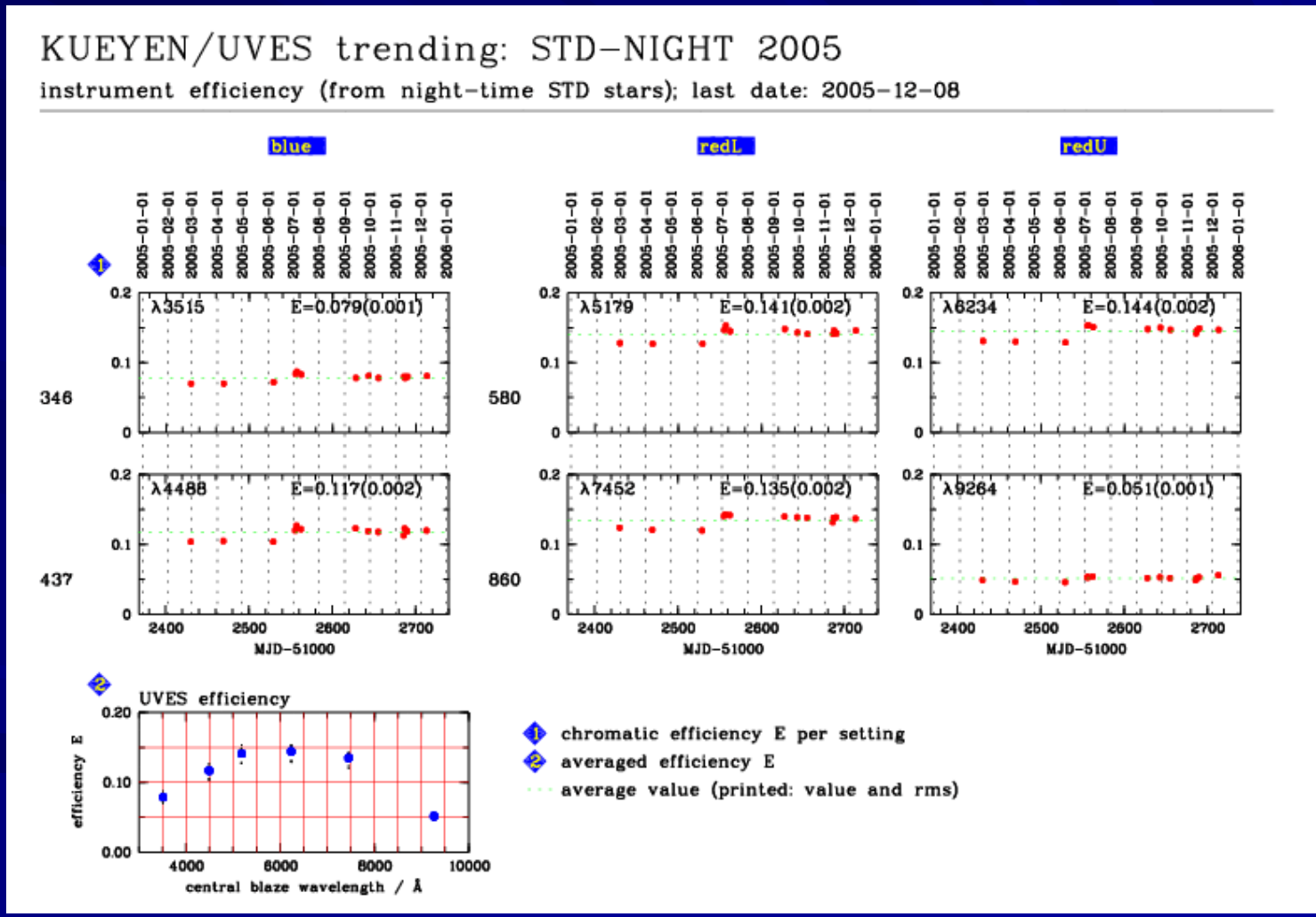
VLT(I) Instrument Operations

Quality Control tools



VLT(I) Instrument Operations

Quality Control tools



Instrument Operations
Instrument Operation Teams (IOTs)

Instrument Scientist(s) and Fellow(s) (Science Operations Department)
Instrument Responsible Instrumentation and
Software Engineers (Engineering Department)

La Silla Paranal (Chile)

User Support Scientist (User Support Department)
Quality Control Scientist (Data Flow Operations and Quality Control Group)
Pipeline Development Responsible (Pipeline Development Group)
Instrument Scientist (Instrumentation Division)
Instrument Responsible (Instrumentation Division)

Garching (Germany)

For your preferred instrument

Instrument Operations

Instrument Operation Teams (IOTs)

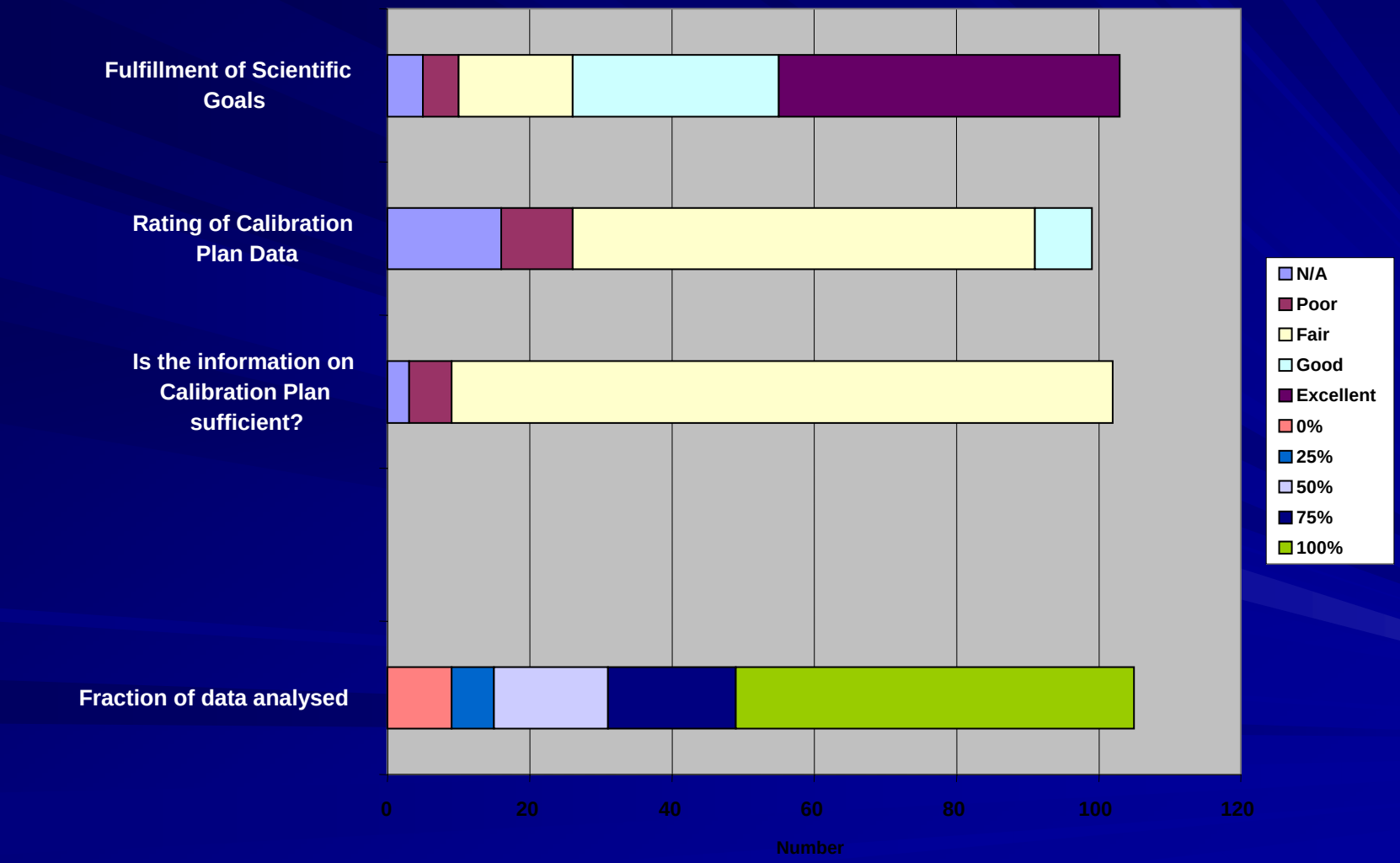
Instrument Scientist(s) and Fellow(s) (Science Operations Department)
Instrument Responsible Instrumentation and
Software Engineers (Engineering Department)

The LSO PSO core IOT focuses on:

- Scientific performance and operational efficiency
- Definition, implementation and execution of calibration plans
- Verify and guarantee the delivered data quality

- Technical and system engineering aspects
- Definition, implementation and execution of maintenance plans
- Verify and guarantee the availability for operations

Instrument Calibration at the La Silla Paranal Observatory



Instrument Calibration at the La Silla Paranal Observatory

	Fulfilment of Scientific Goals	Rating of Calibration Plan Data	Is the information on Calibration Plan sufficient?			Fraction of data analysed
N/A	5	16	3		0%	9
Poor	5	10	6		25%	6
Fair	16	65	93		50%	16
Good	29	8	0		75%	18
Excellent	48	0	0		100%	56

IOTs

The end