In viaggio con i dati LBT

ovvero il servizio di riduzione dati spettroscopici per LBT Italia attivo presso IASF-Milano

Marco Fumana

Summary

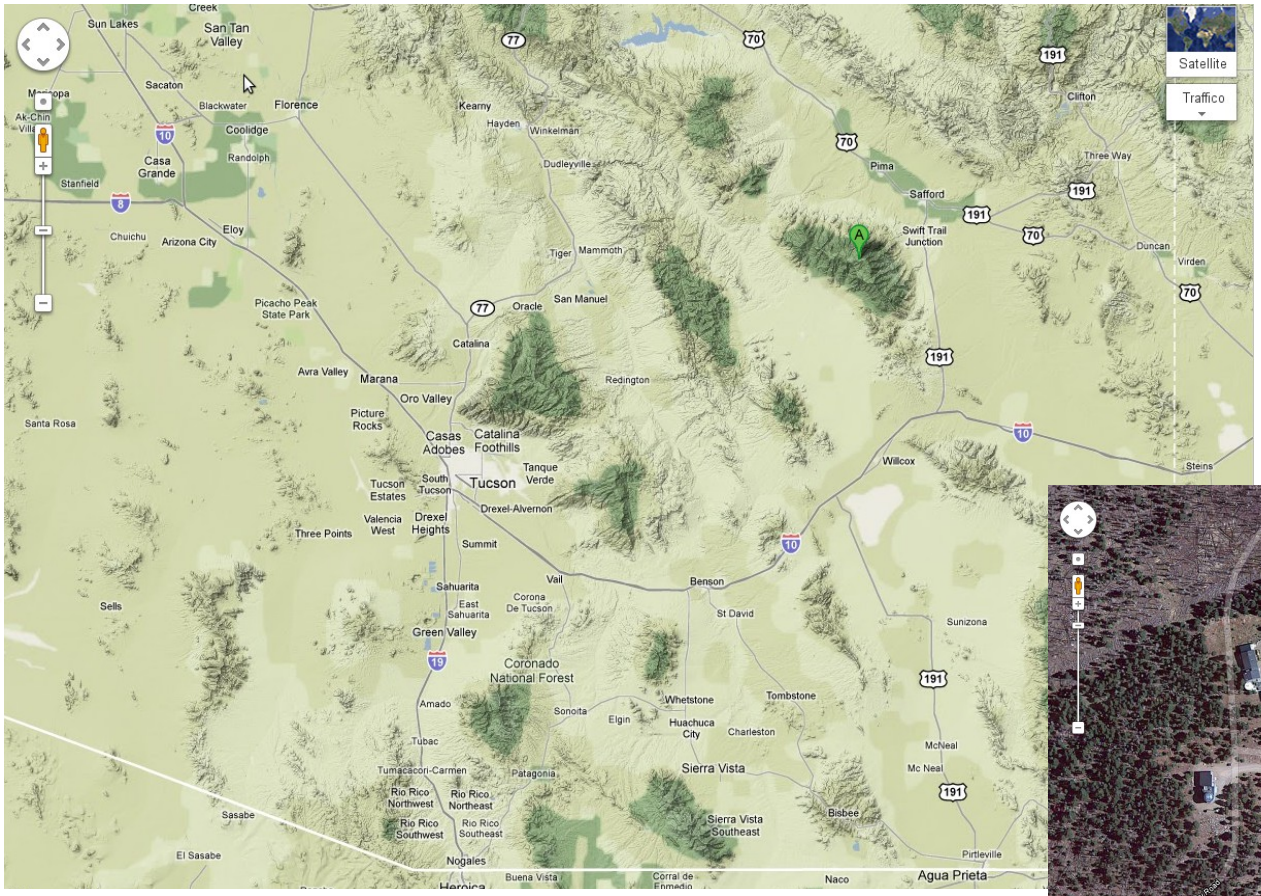
1. Data acquisition

    1.1 LBT Tour

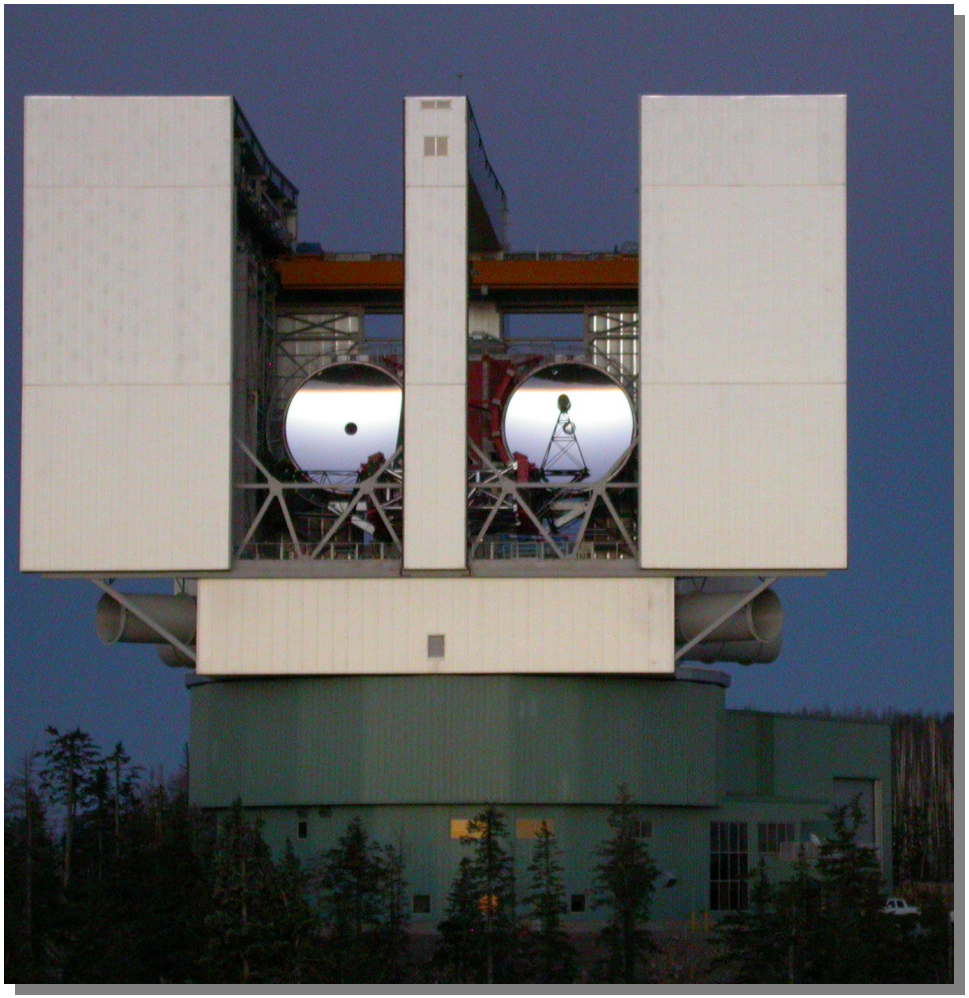
2. Data reduction

3. Data distribution

LBT location



Observatory



Congressional approval of site: Nov 1988

Construction began: July 1996

First light: Oct 2005

Telescope mass: ~650 metric tons

Building pier diameter: 23 meters

Mirror weight: ~17.7 metric tons each

Mirror size: 8.408 meters

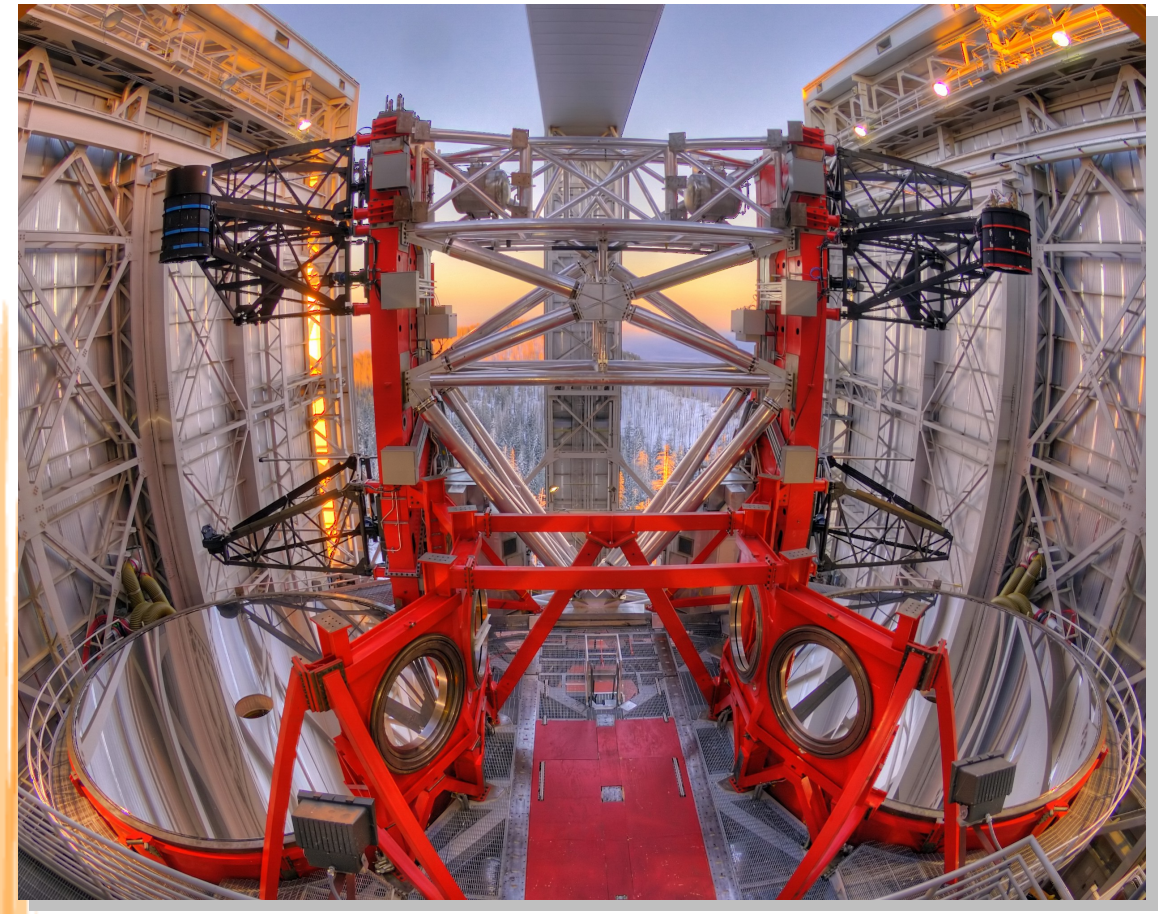
LBT enclosure height: 51 meters

Observatory elevation: 3221 meters

Number of LBTO employees: 50 ±

http://www.lbto.org/index.htm

Telescope and mirrors



Primary Mirror

- size: 8.408 m
- optic: active
- center hole diameter: 0.889 m
- thickness at center hole: 0.437
- thickness at edge: .894 m
- Steward Observatory (Tucson)

Secondary mirror

- diameter: 0.91 m
- optic: active and adaptive
- Osservatorio di Arcetri

http://www.lbto.org/optics.htm

Operating instruments

- **LBC** (Italy)

  Large Binocular Camera

- **(LUCIFER1)** (German)

  LBT NIR spectroscopic Utility with Camera and Integral-field for Extragalactic Research

- **MODS1** (Ohio)

  Multi-Object Double Spectrographs

http://www.lbto.org/instruments.htm

Future instruments

- **LBTI** (Arizona+NASA)

  LBT Interferometer

  http://lbti.as.arizona.edu/LBTI-Main/Project.html

- **LINC-NIRVANA** (MPIA+INAF+Altri isti ted)

  LBT interferometric camera

  http://www.mpia-hd.mpg.de/LINC/

- **PEPSI** (API)

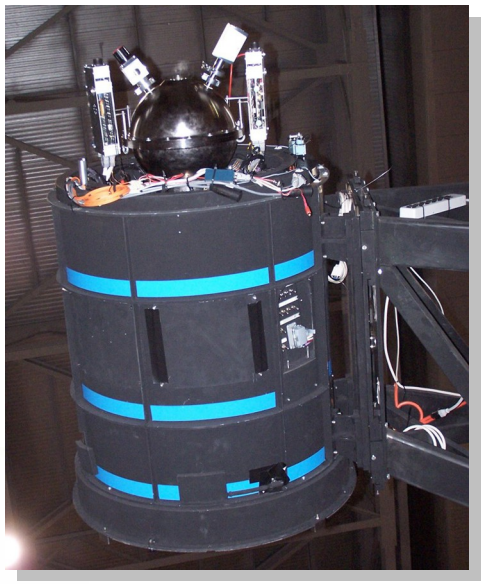
  fibre-feed high-resolution Echelle spectrograph

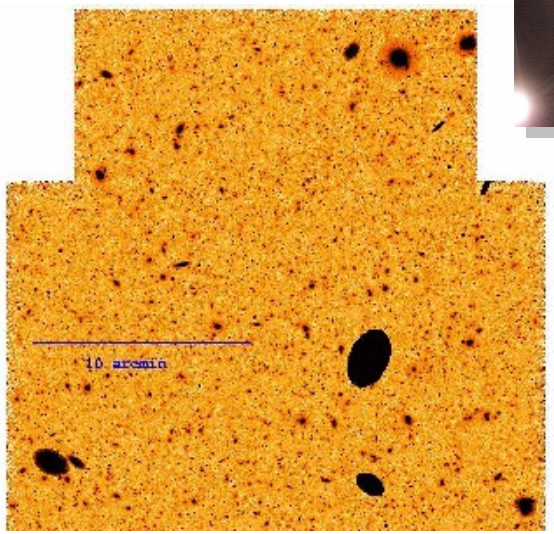
  http://www.aip.de/pepsi/index.php?id=21

LBC instrument characteristics

- Field of view: equivalent to 23'x23'
- Sampling: 0.23”/px
- Optical design and detectors are optimized in different wavelength ranges:
  - UV-blue (from 320 to 500 nm, UBV bands)
  - red-IR bands (from 500 to 1000 nm, Riz bands)
- 4chips (2048x4608)

  equivalent to 6150x6650





http://lbt.inaf.it/

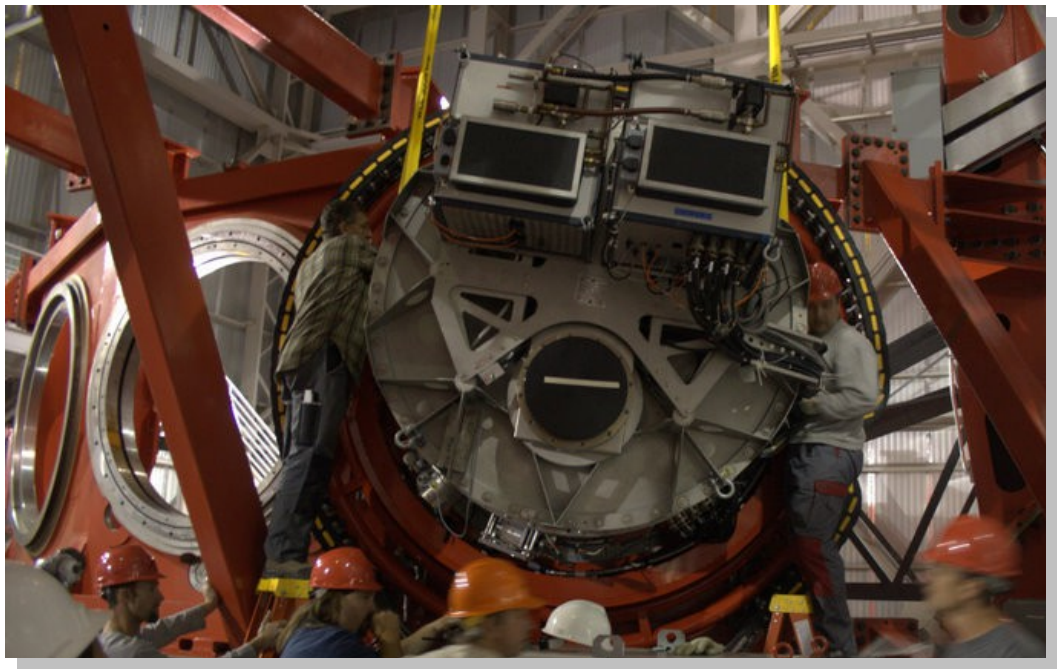
Luci instrument characteristics

- Wavelengths: 870 – 2400 nm (zJHK)

Camera	N1.8	N3.75	N30 (not available yet)
Scale (“/pixel)	0.25	0.12	0.015
FOV	4'x2.8'	4'x2.8'	0.5'x0.5'
Resolution	1900...8500	3800...17000	10000...40000
Mode	LSS,MOS	LSS,MOS	LSS

- Available gratings:
  - 150Ks
  - 200H+K
  - 210zJHK
- Imaging field of View: 4' x 4'
- Operating since dec 09

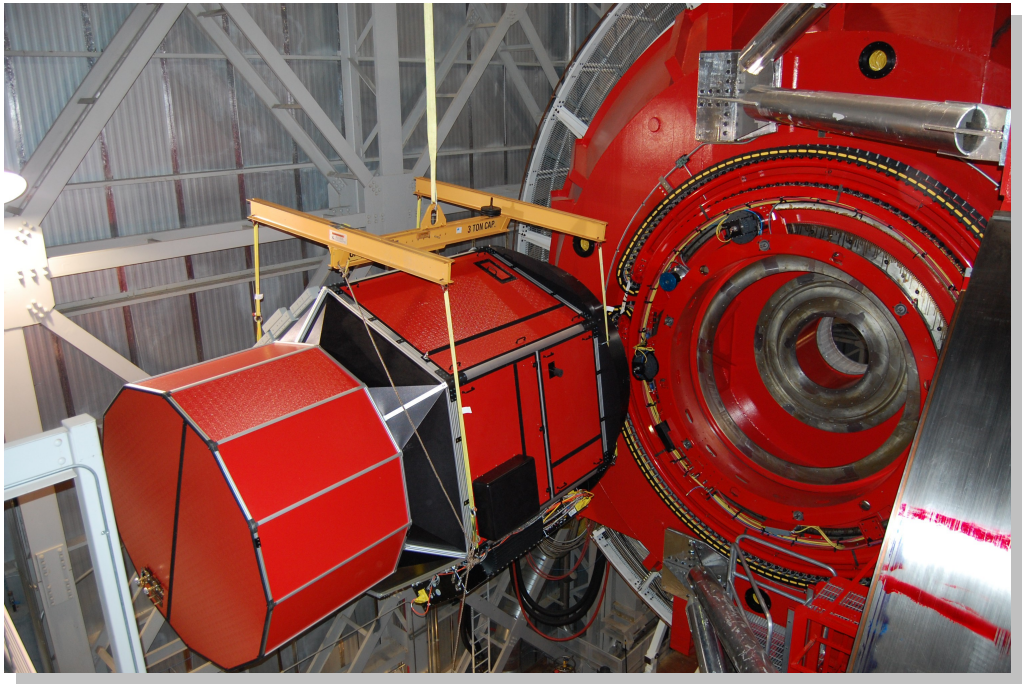
(not operating now)



http://www.astro.rub.de/LuciferHome

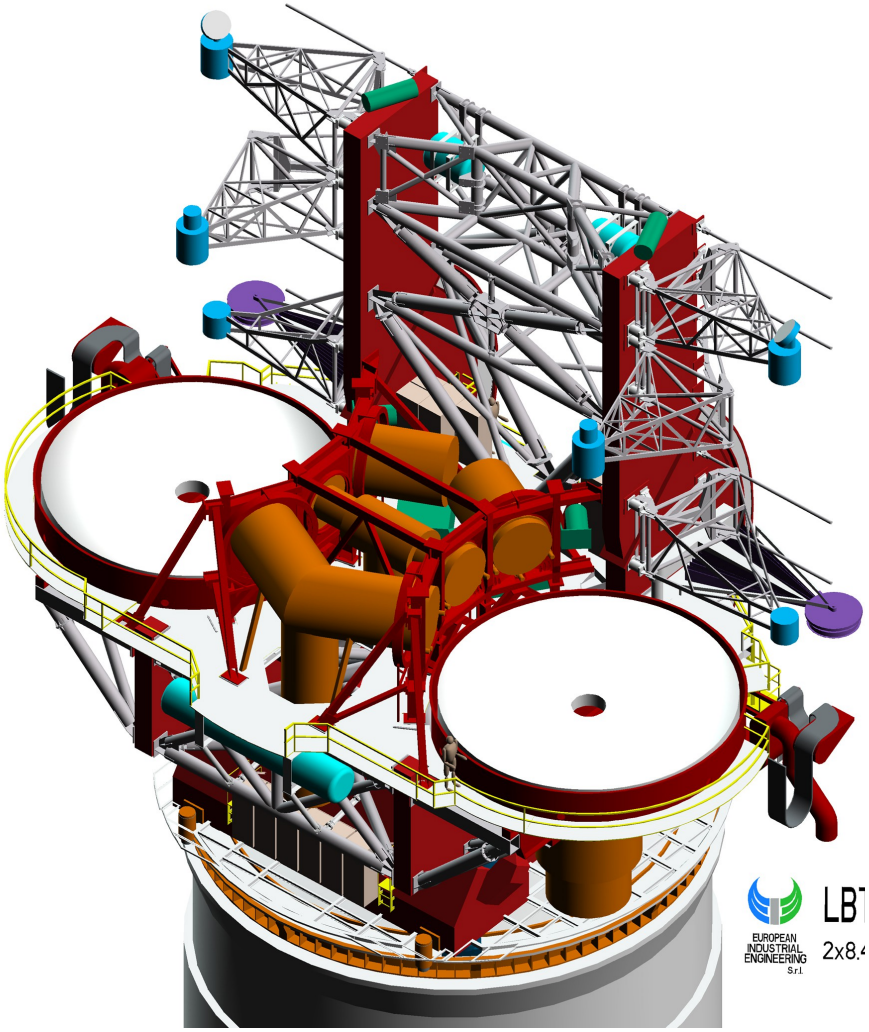
MODS instrument characteristics

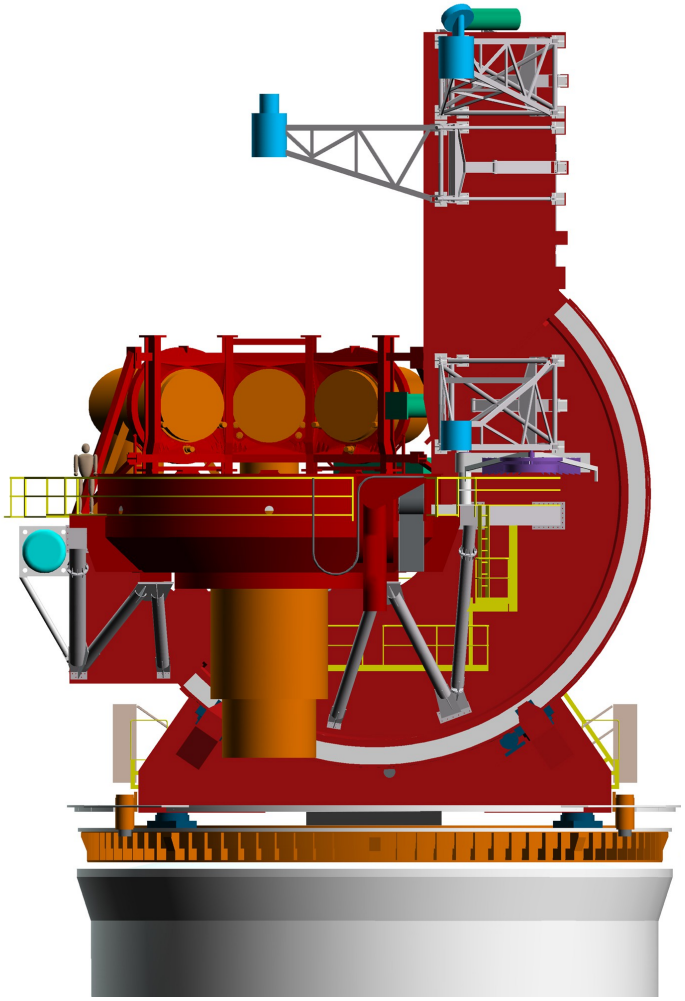
- Design: Seeing-Limited Optical Double Spectrograph
- Wavelengths: 320-1100nm
- Dichroic: Blue-transmit/Red-reflect, 565nm cross-over wavelength
- Field of View: 6' x 6'
- Operating since sett 11
- Pixel Scale:
  - Blue: 0.120 “/pixel
  - Red: 0.123 “/pixel
- Operating Modes:
  - Direct Imaging
  - Grating spectroscopy R~2000
  - Prism spectroscopy R=500-150
- Operating since sept 11 **(sharing risk)**



http://www.astronomy.ohio-state.edu/MODS/

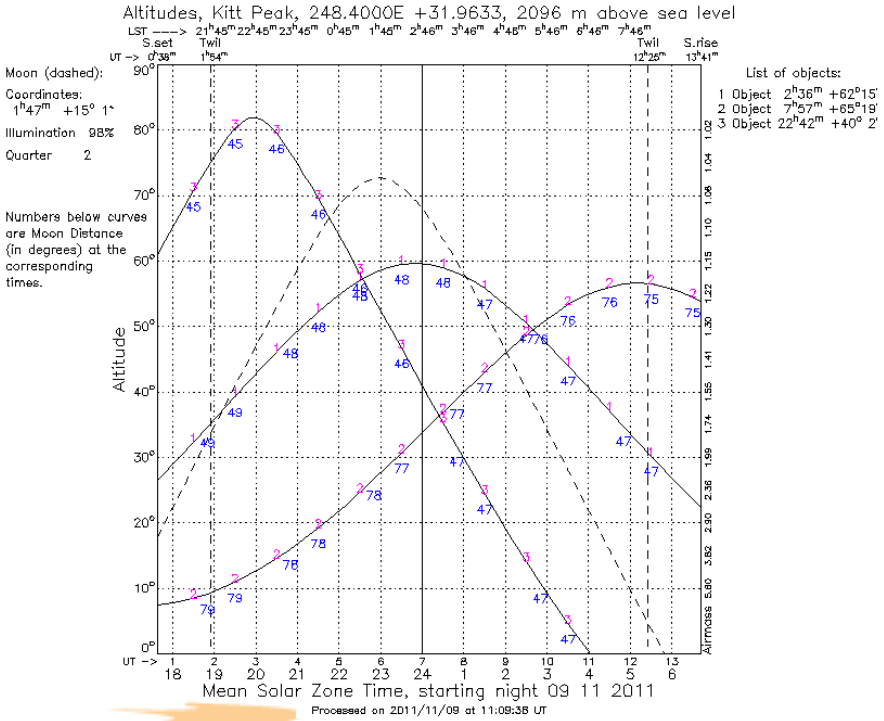
Instrument locations

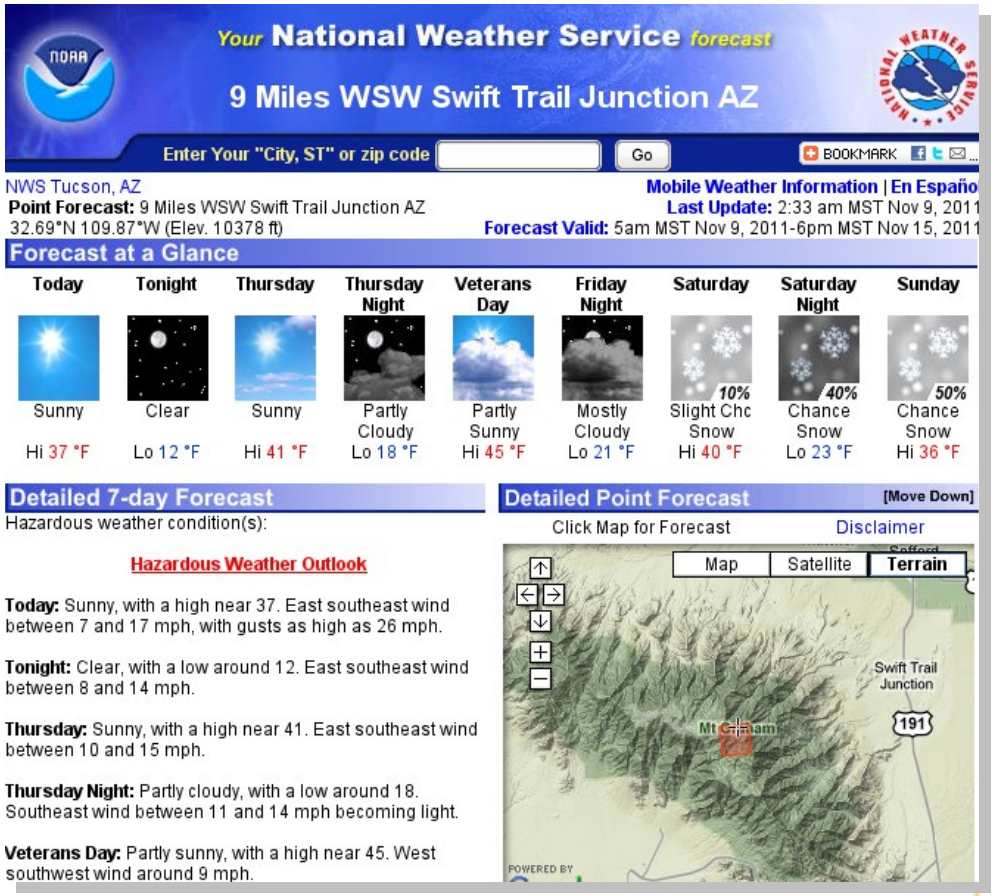




Observations planning

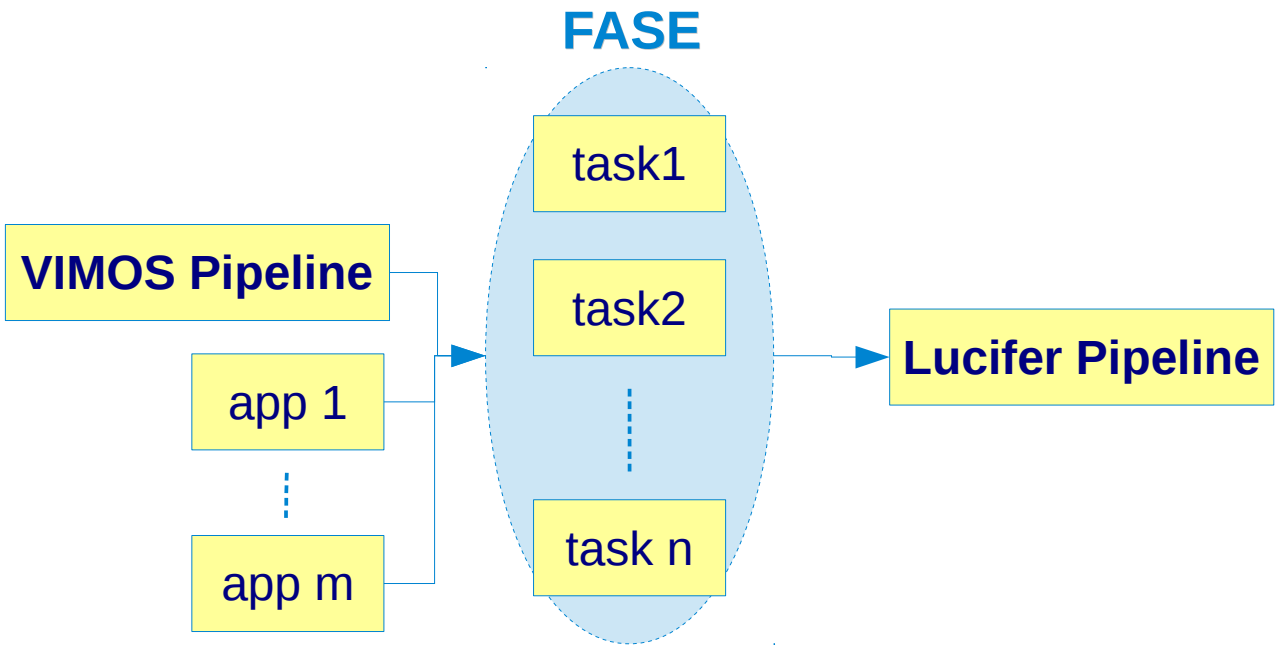
- Target ranking
  - Object visibility
  - Proposal constraints
- Available instruments
- Sky conditions
- OB check





Data reduction

Lreducer: Luci reduction pipeline



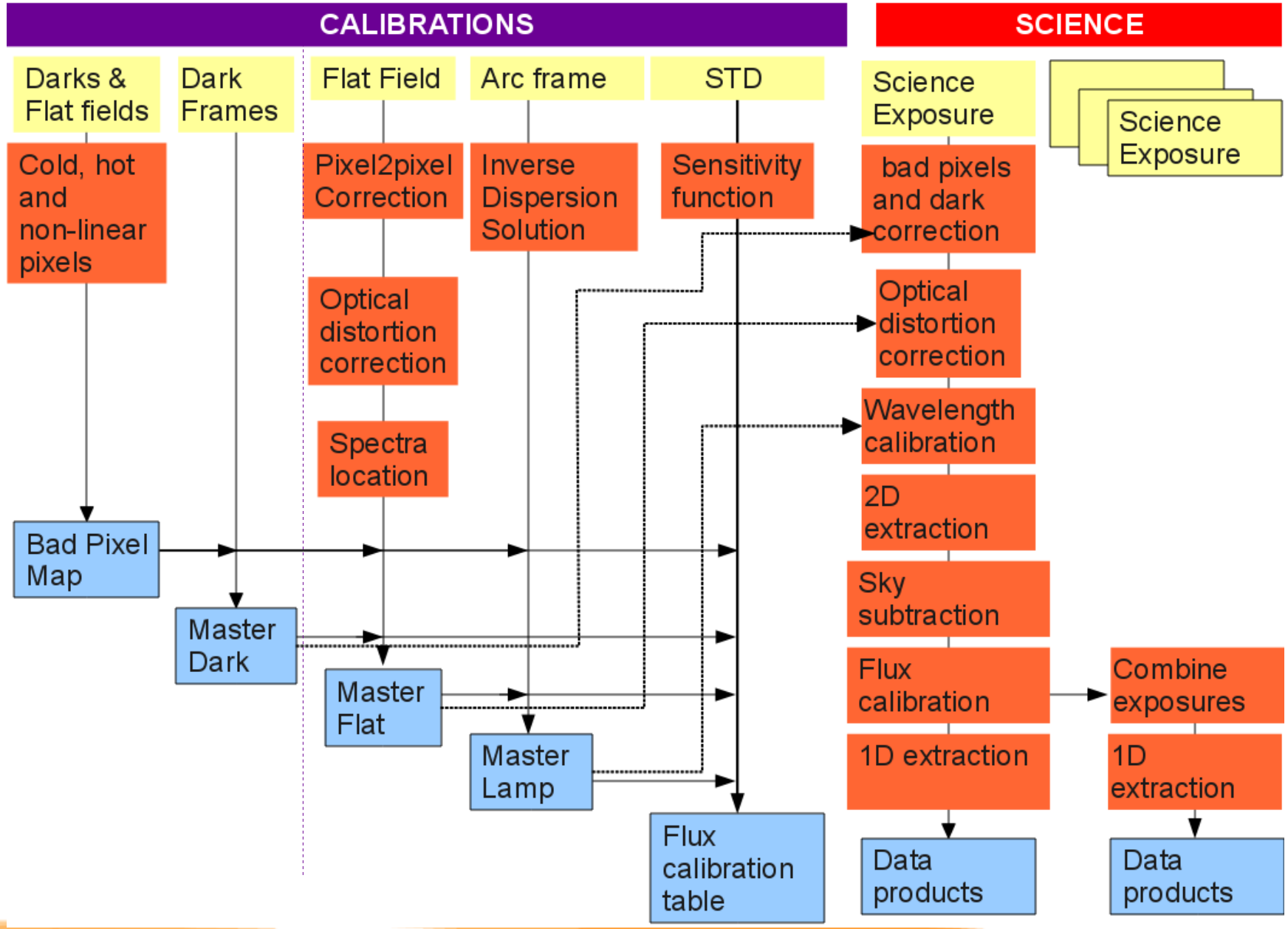
- Inherits from VIMOS experience
- VIMOS pipeline was already subdivided in simple tasks
- Adaptation to specific cases (e.g. longslit)
- Adapted to common framework (FASE, Opticon w.g. 9.2) to let them interact

  (See Astrosiesta “Spectroscopix: la spettroscopia in FASE” by Luigi Paioro)
- Plugged in missing parts (e.g. sky subtraction)

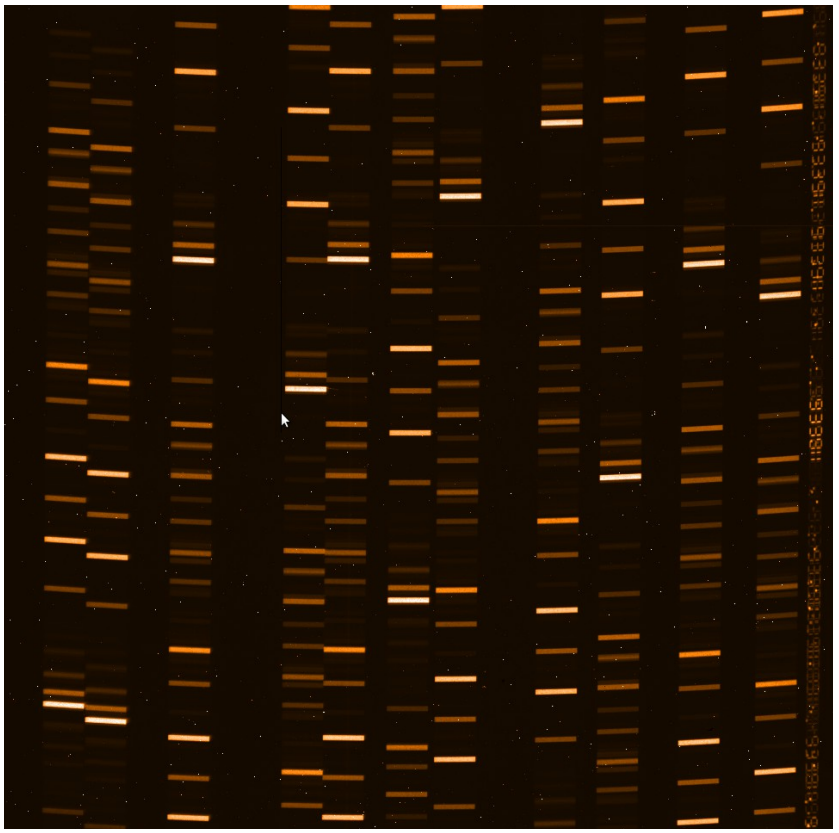
Pipeline ready in 6 months

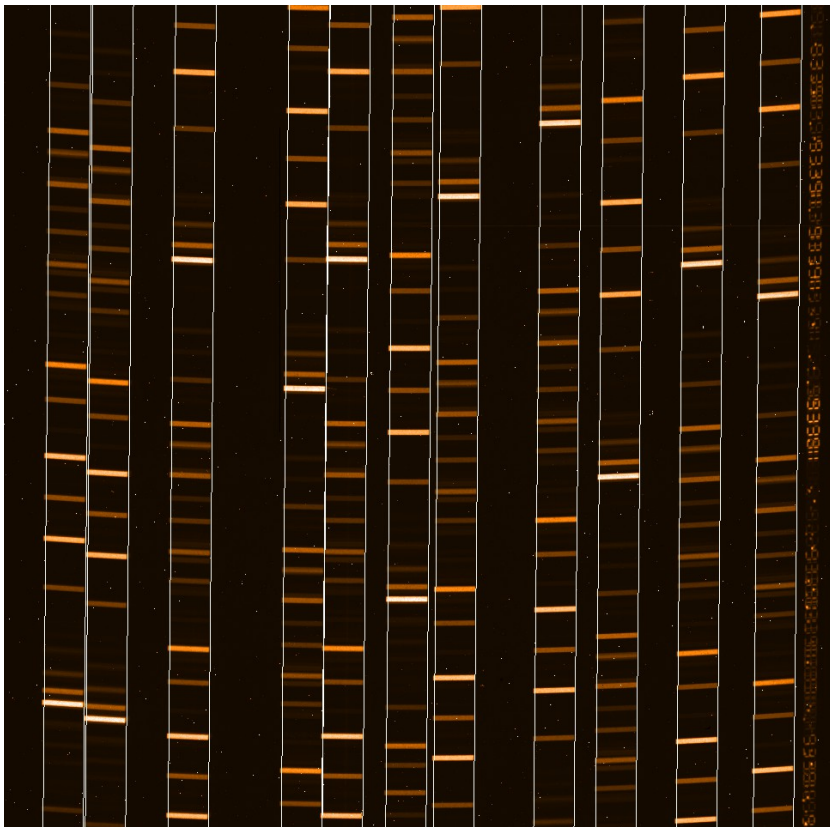
http://www.iasf-milano.inaf.it/Astro-Siesta/2011.html

Lreducer details

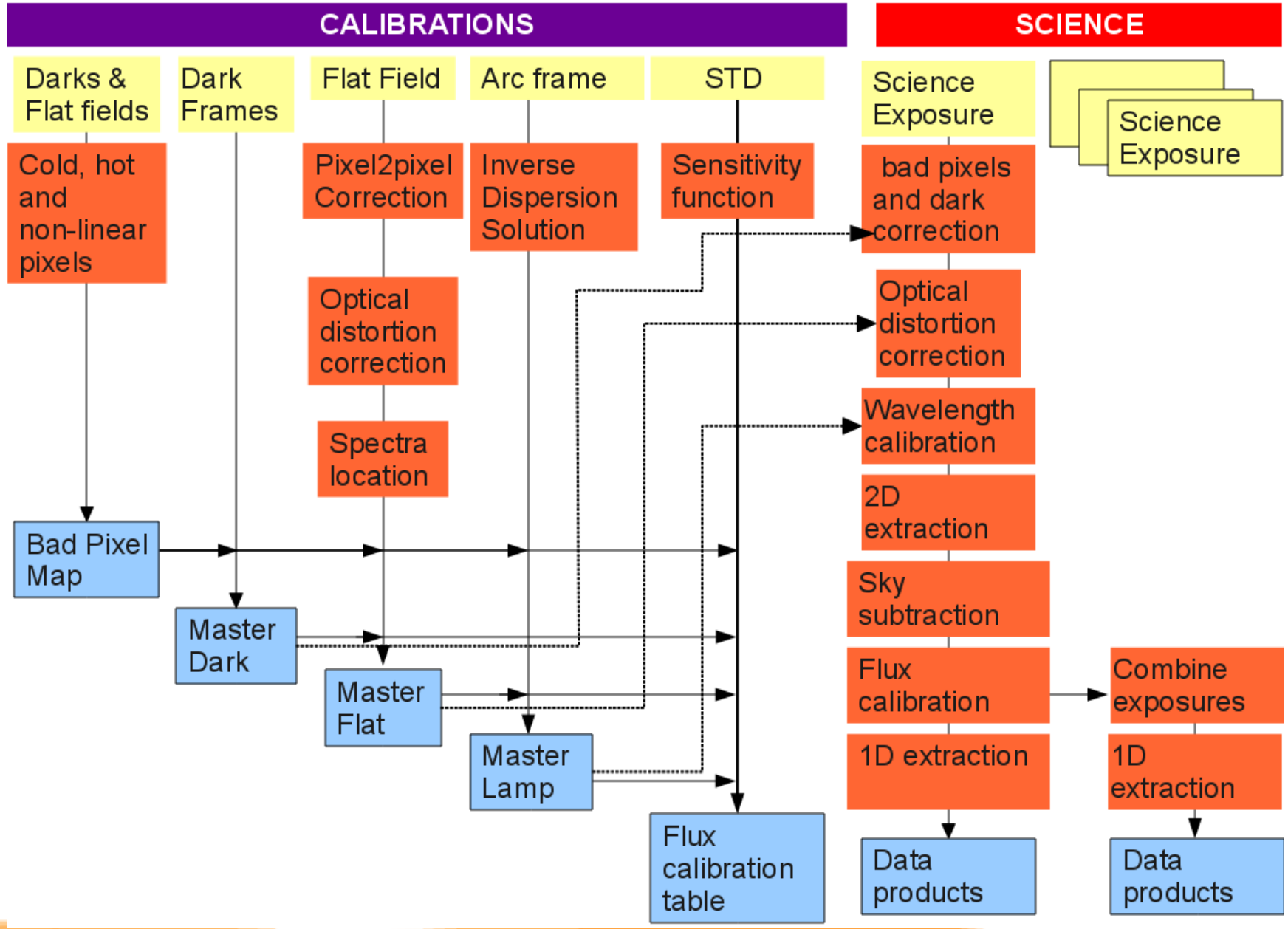


Spectra locations



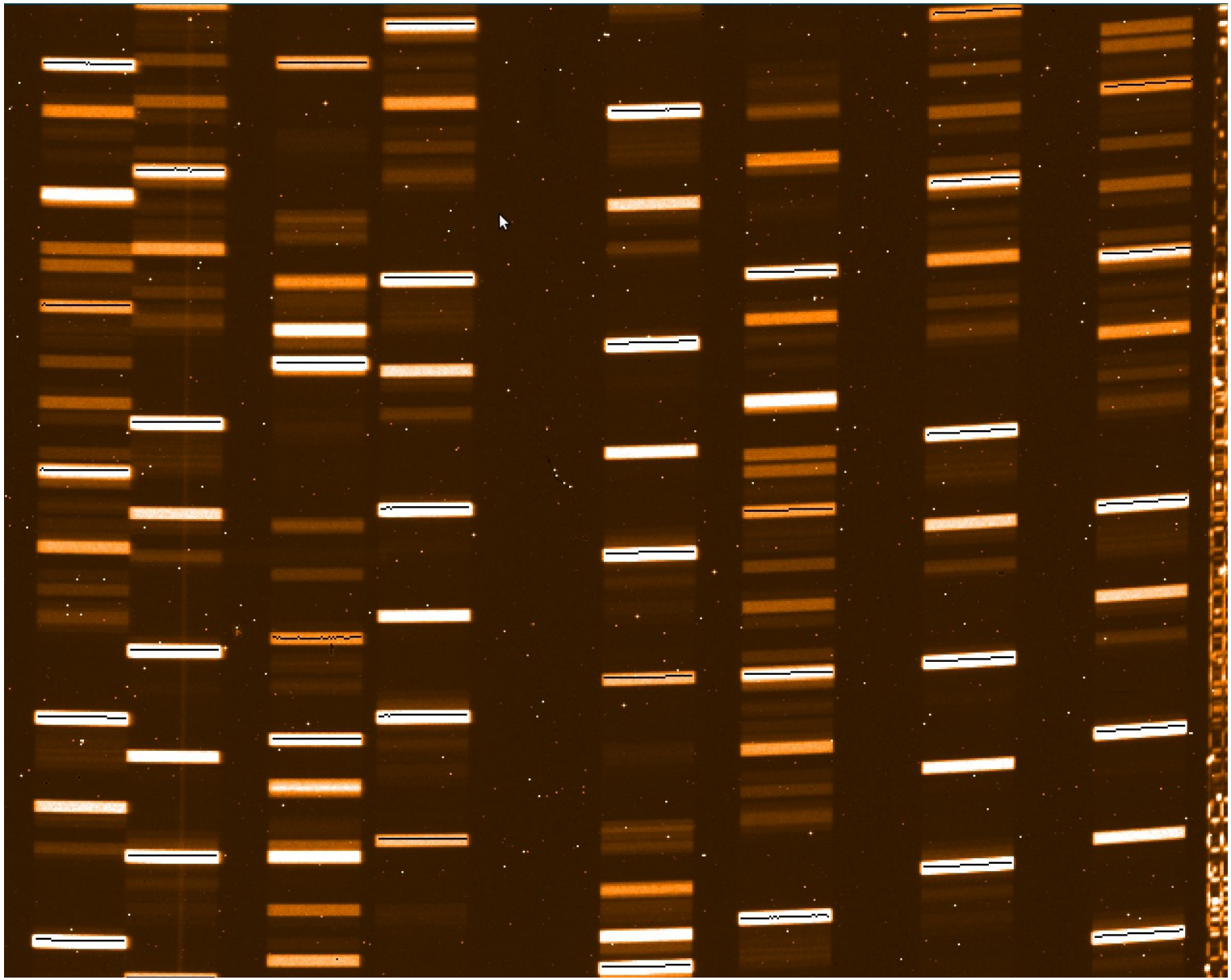


Lreducer details



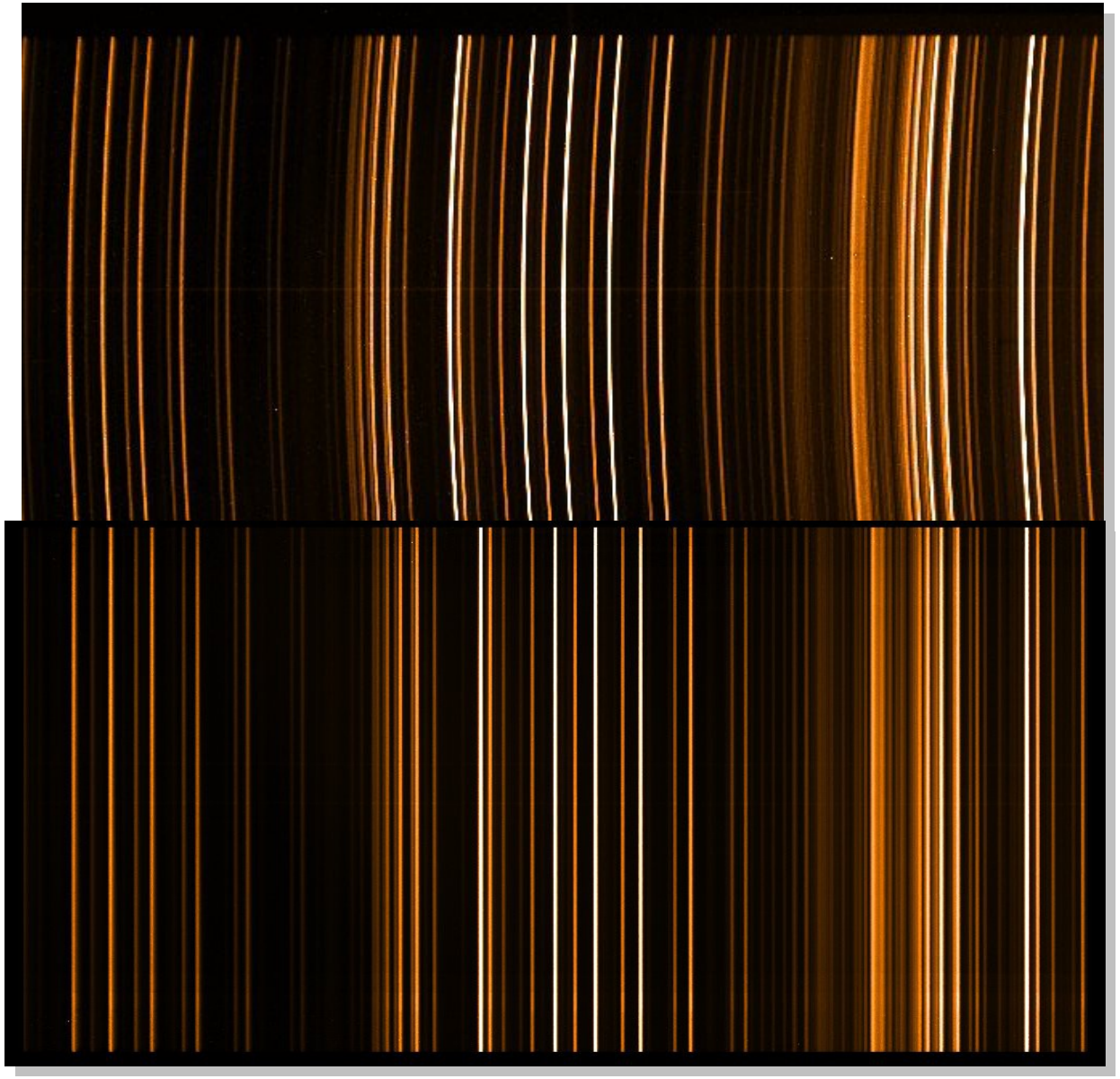
Lambda calibration

MOS
Grism 210 zJHK
λcen = 1.646
1.08 Å/pix



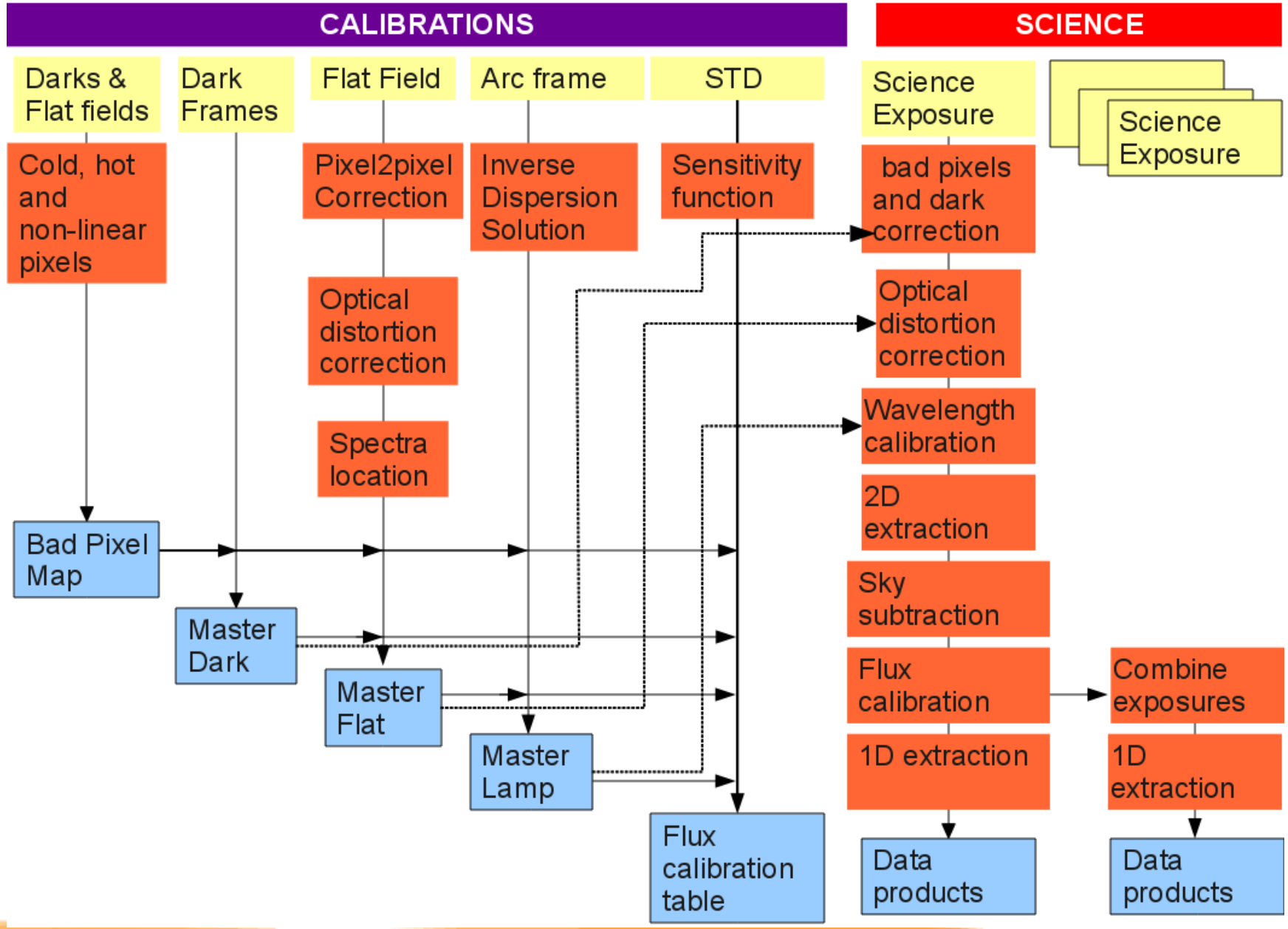
Optical distortion corrections

Raw Data
Longlist
Grism 210 zJHK
λcen= 1.23

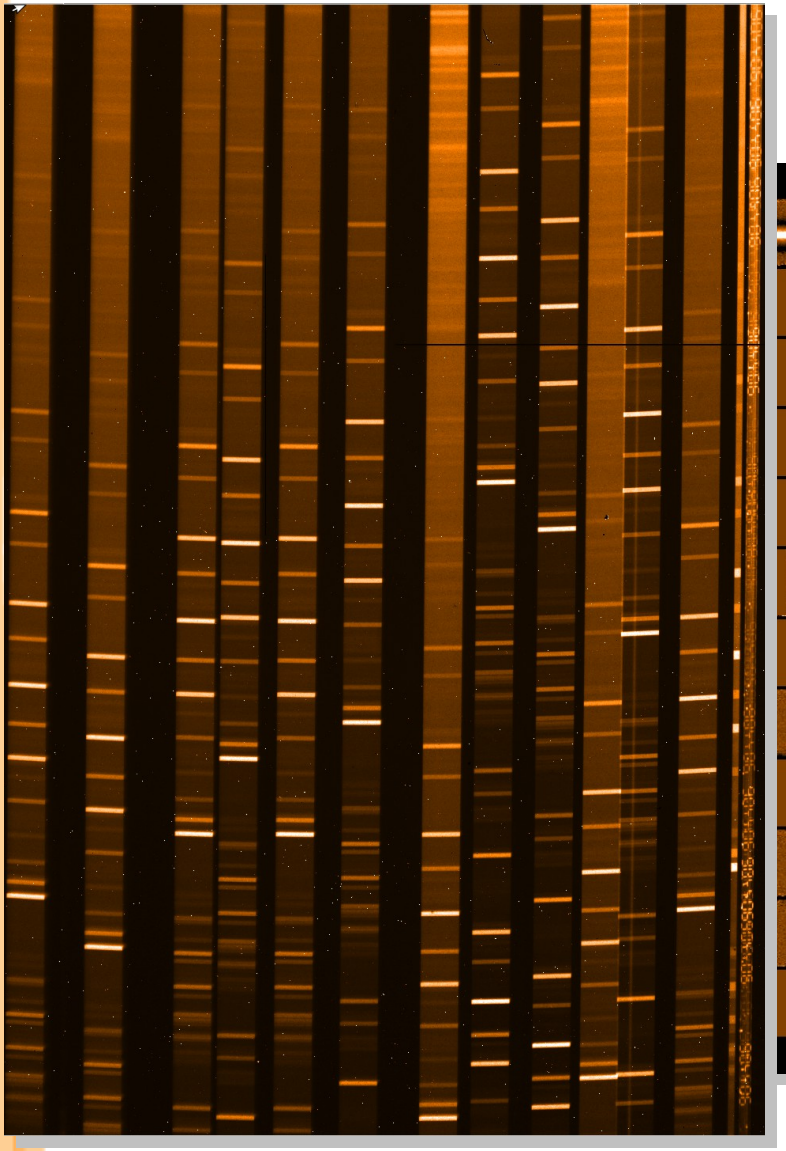


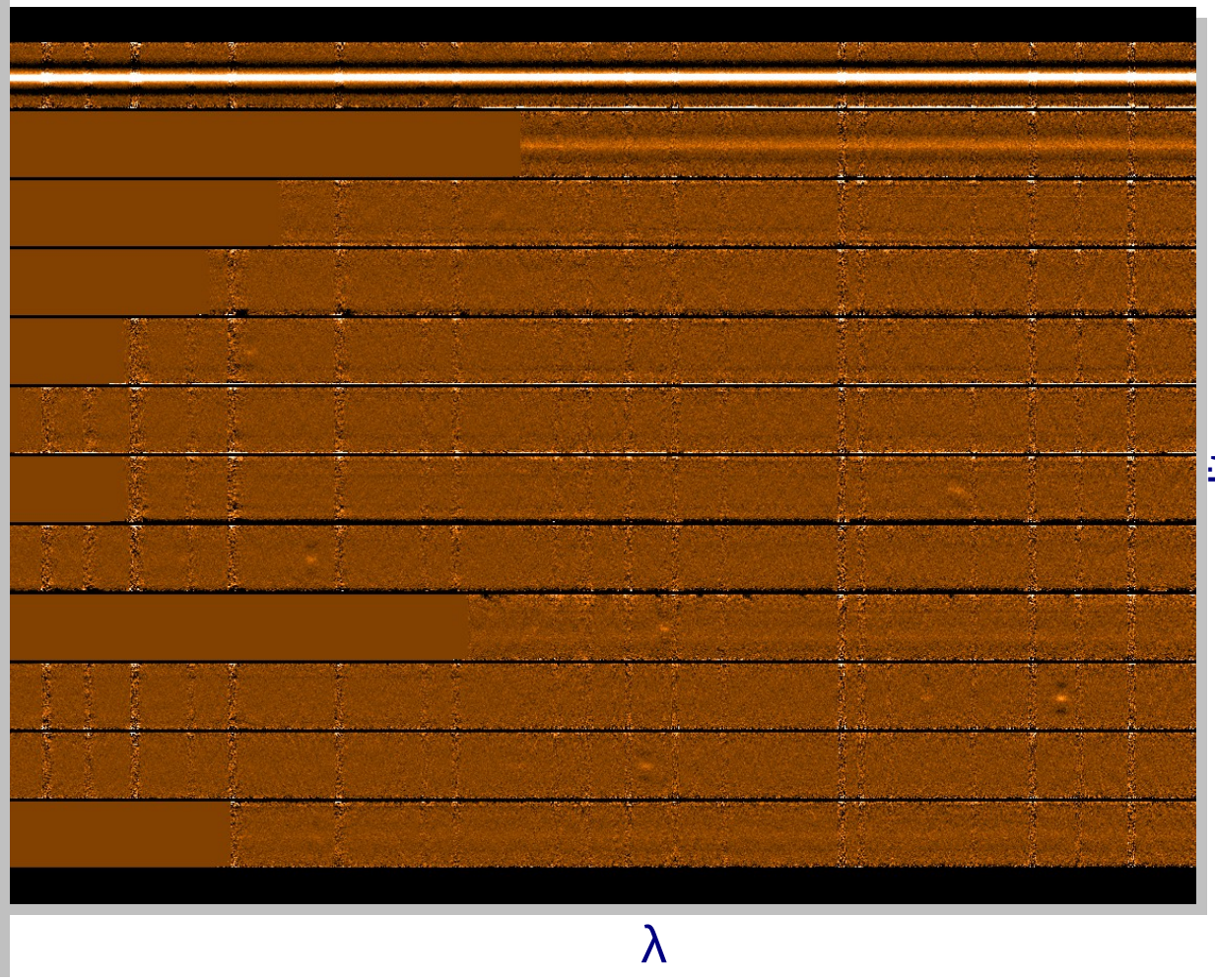
Data
corrected for
optical distortions

Lreducer details



Luci reduced data





Data distribution

IASF-MI website

Data products:

- 2d spectra λ(and flux) calibrated
- 1d spectra,λ and flux calibrated
- Sky spectra λ calibrated
- All exposures combined
- Others upon request

Italian LBT Spectroscopic Reduction Center

Italian LBT Scectroscopic Reduction Center
INAF Milano
User: Magrini
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Reduction Status

PI	TARGET	MASK	CAMERA	GRISM	FILTER	TILT	STATUS
Cresci	HDFN	cresci66	N1.8	210_ZJHK	K	2.2100	Reduced
Cresci	HDFN	cresci66	N1.8	210_ZJHK	H	1.6100	Reduced
Gallerani	SDSSJ1048+4637_ref	LS 600	N1.8	210_ZJHK	J	1.1700	Reduced
Gallerani	SDSSJ1048+4637_ref	LS 600	N1.8	210_ZJHK	Z	0.9600	Reduced
Grazian	GOODS-N1	M095	N1.8	200_H+K	ORDERSEP	1.9300	Reduced
Grazian	GOODS-N2	M100	N1.8	200_H+K	ORDERSEP	1.9300	Reduced
Longhetti	S2F1-142	LS 600	N1.8	150_KS	KS	2.1570	Reduced
Longhetti	S2F1-142	LS 600	N3.75	150_KS	KS	None	Reduced
Magrini	7c17_cluster_H	992414.magrini	N1.8	210_ZJHK	H	1.5900	Reduced
Magrini	7c17_cluster_J	992414.magrini	N1.8	210_ZJHK	J	1.2100	Reduced
Maiolino	HDFH1	950337.RMHDFH1	N1.8	210_ZJHK	H	1.5800	Reduced
Maiolino	HDFK1	RMHDFK1	N1.8	200_H+K	ORDERSEP	1.9600	Reduced
Maiolino	HDFK2	RMHDFK2	N1.8	200_H+K	ORDERSEP	1.9300	Reduced
Mannucci	HDFN	M077	N1.8	210_ZJHK	H	1.6100	Reduced
Mannucci	HDFN	M075	N1.8	210_ZJHK	K	2.2100	Reduced
Mannucci	Q1422	M077	N1.8	210_ZJHK	K	2.1900	Reduced
Mannucci	Q1422	M077	N1.8	210_ZJHK	H	1.6400	Reduced
Palazzi	GRB070306	LS 600	N1.8	210_ZJHK	J	1.2300	Reduced
Palazzi	GRB070306	LS 600	N1.8	210_ZJHK	H	1.6400	Reduced
Pentericci	Cluster1	penter128	N1.8	200_H+K	ORDERSEP	1.9300	Reduced
Pentericci	Cluster2	penter129	N1.8	200_H+K	ORDERSEP	1.9300	Reduced
Turatto	SN2009kn	LS 600	N1.8	200_H+K	ORDERSEP	1.9300	Reduced
Turatto	SN2010gi	LS 600	N1.8	200_H+K	ORDERSEP	None	Reduced
Turatto	SN2010hq	LS 600	N1.8	200_H+K	ORDERSEP	None	Reduced
Turatto	SN2010jl	LS 600	N1.8	200_H+K	ORDERSEP	1.9300	Reduced
Turatto	SN2011B	LS 600	N1.8	200_H+K	ORDERSEP	1.9300	Reduced
Turatto	SN2011dh	LS1.00_600um	N1.8	200_H+K	ORDERSEP	1.9300	Reduced

Italian LBT Spectroscopic Reduction Center

Italian LBT Scectroscopic Reduction Center
INAF - IASF Milano
User: LBTManager
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Home | Reduction Status | Login | Logout | About Us | Contact Us

Longhetti Data

Targets

S2F1-142
2010-10-09
2010-10-10

S2F1-142
2010-01-16
2010-02-18

Config account

S2F1-142 150_KS KS
Available data:

1. Spectra_fluxes.tgz
2. README
3. reductionResult.fits

S2F1-142 150_KS KS
Available data:

1. Spectra_fluxes.tgz
2. README
3. reductionResult.fits
4. Spectra_counts.tgz

Powered by Django

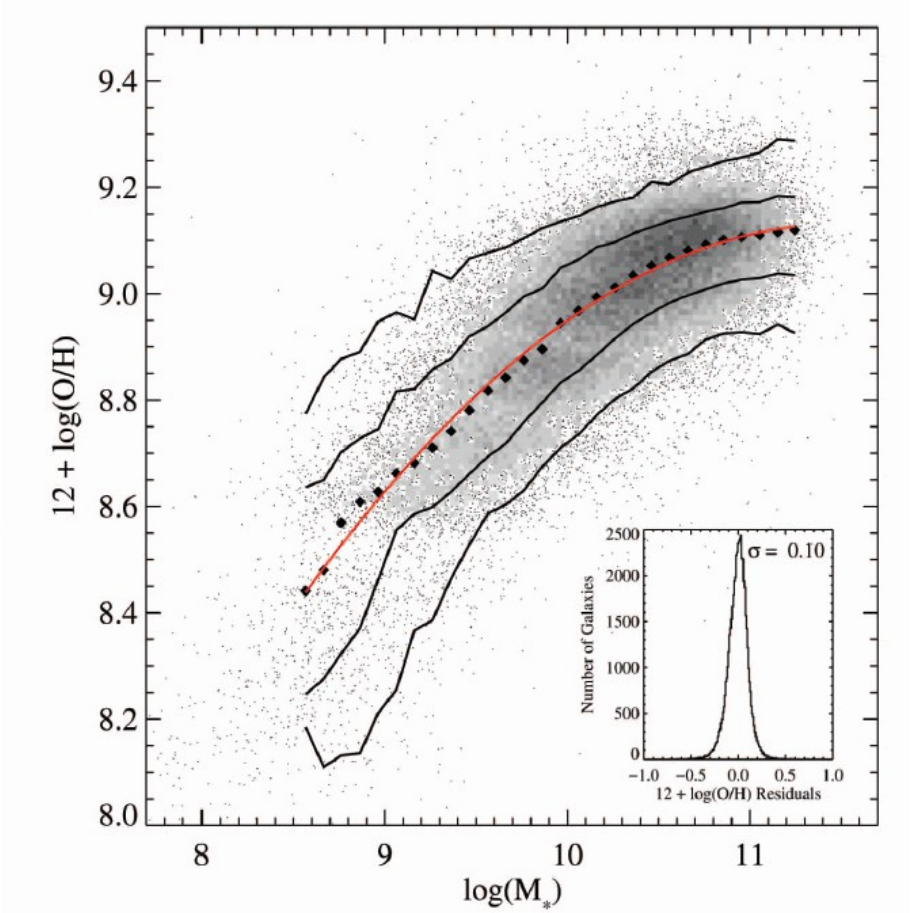
http://lbt-spectro.iasf-milano.inaf.it/

IASF-MI website

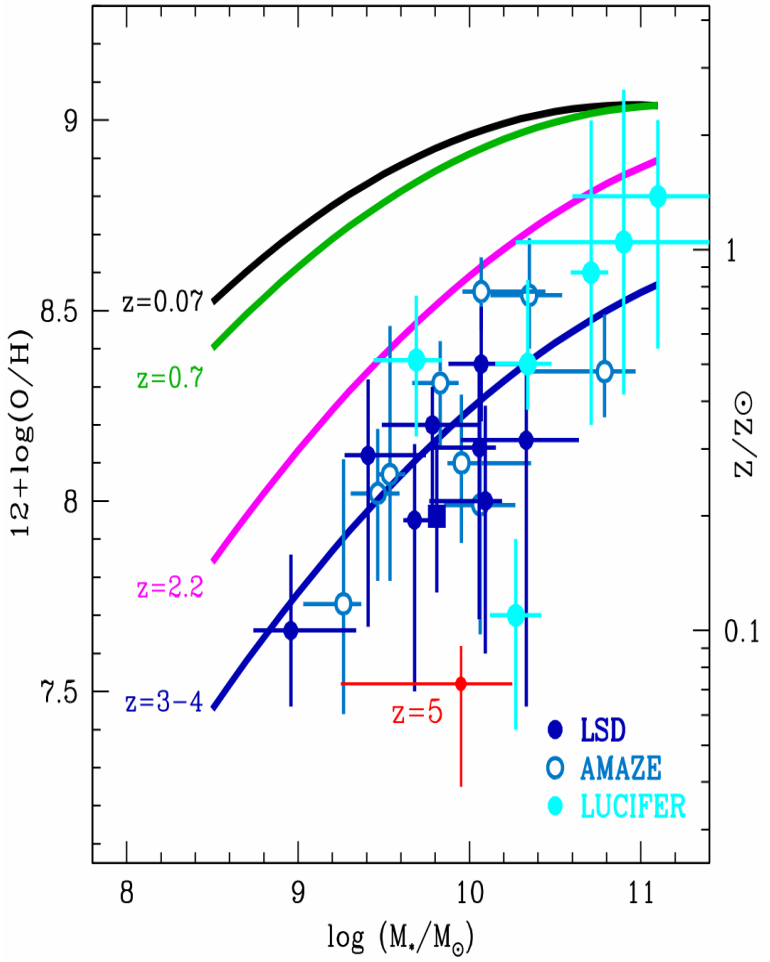
- 57 nights (since jan 2010)
- 10 astronomers
- 26 targets
- post-reduction interaction

http://wiki.lbto.arizona.edu/twiki/bin/view/PartnerObserving/ItalyQueue2010

Scientific results example



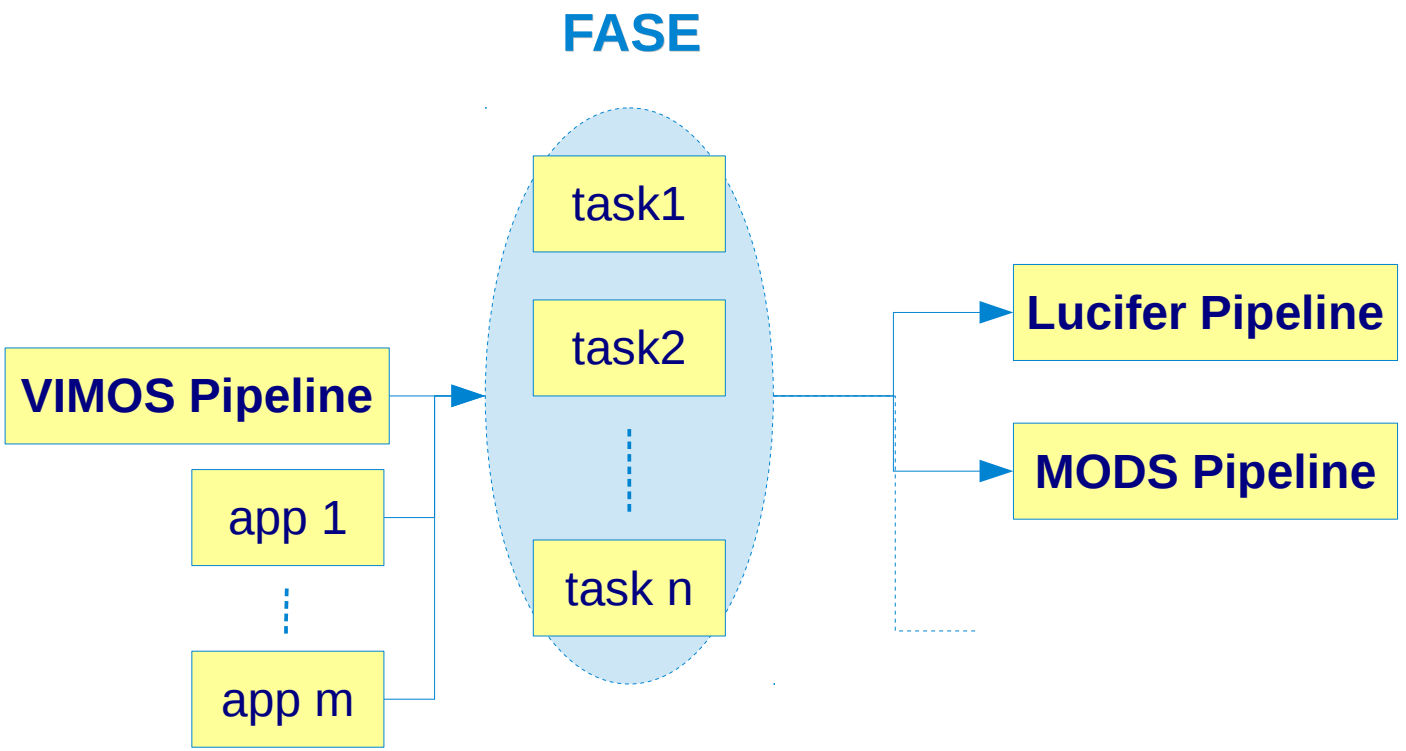
50.000 SDSS galaxies Tremonti et al. (2004)



Mannucci, et al. 2010, Cresci et al. 2011

… not only Luci

Mreducer: MODS reduction pipeline



Adaptation to MODS in 3 months

MODS data reduction

work in progress