



# MOONS DRS & future tools

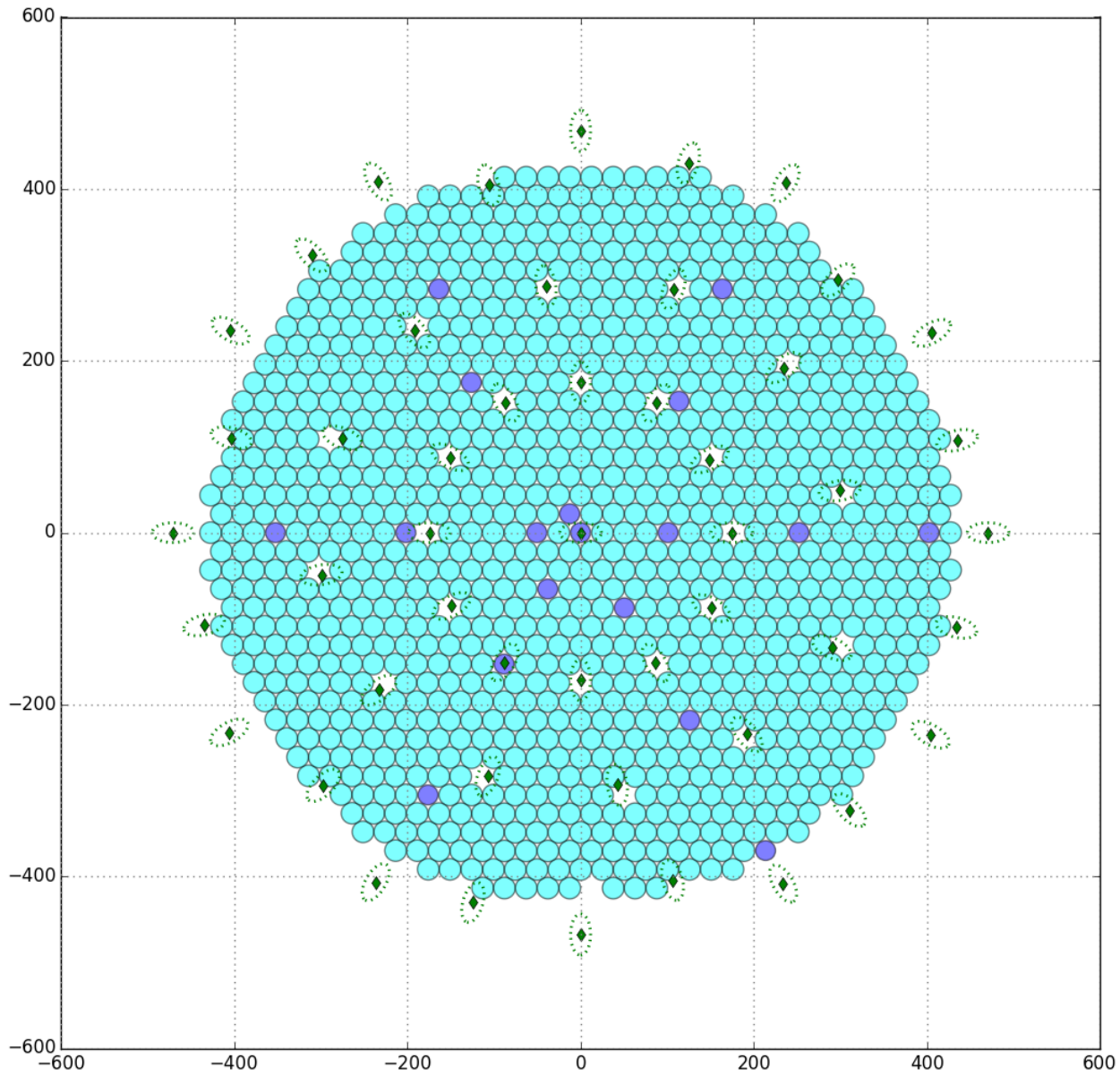
Frédéric ROYER  
GEPI

# Instrument / arms

Arm / config.	Spectral range	<i>R</i>	Comment
RI / low <i>R</i>	0.647 – 0.955 $\mu\text{m}$	4100	simultaneous
YJ / low <i>R</i>	0.934 – 1.350 $\mu\text{m}$	4300	
H / low <i>R</i>	1.452 – 1.800 $\mu\text{m}$	6600	
RI / high <i>R</i>	0.765 – 0.898 $\mu\text{m}$	9200	simultaneous
YJ / low <i>R</i>	0.934 – 1.350 $\mu\text{m}$	4300	
H / high <i>R</i>	1.521 – 1.641 $\mu\text{m}$	18300	

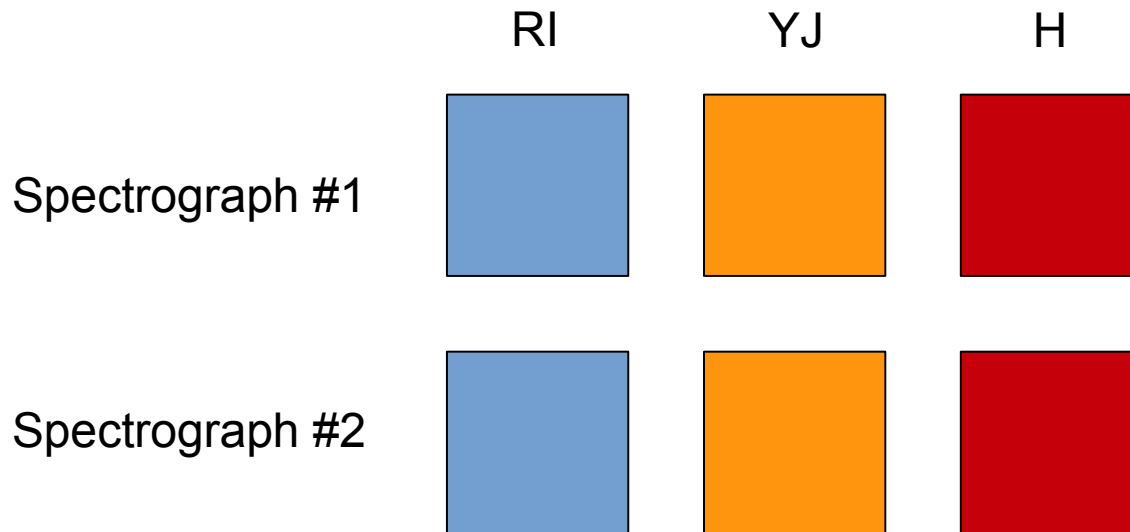


Grid of 1023 positioners in 35 cols x 39 rows with pitch=25.000:



# Instrument / detectors

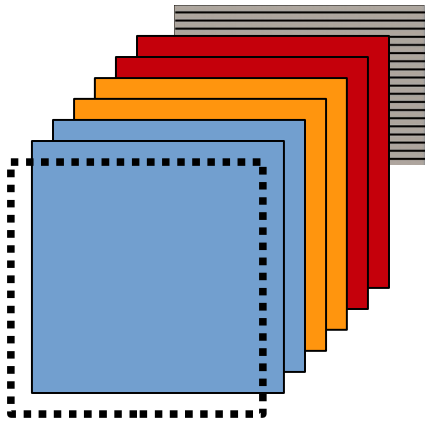
6 4k×4k detectors



# Instrument / data frames

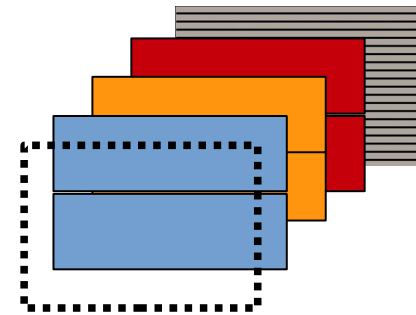
## Raw data

single multi-extension FITS file



## Reduced extracted data

single multi-extension FITS file



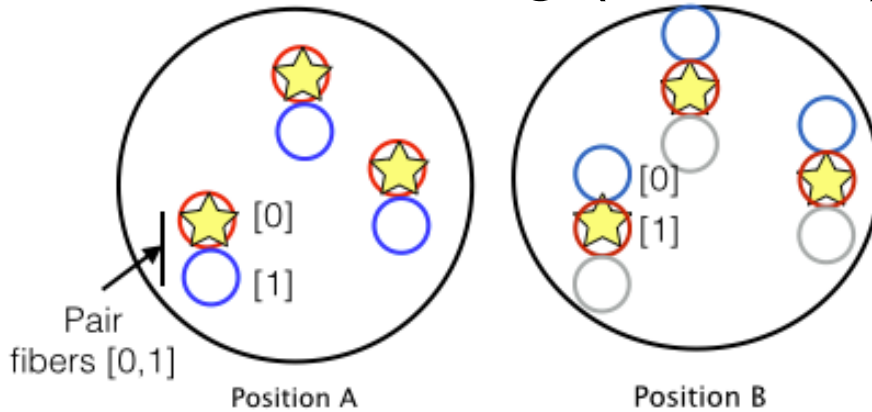
set of single 1D spectra



...

# Instrument / observation modes

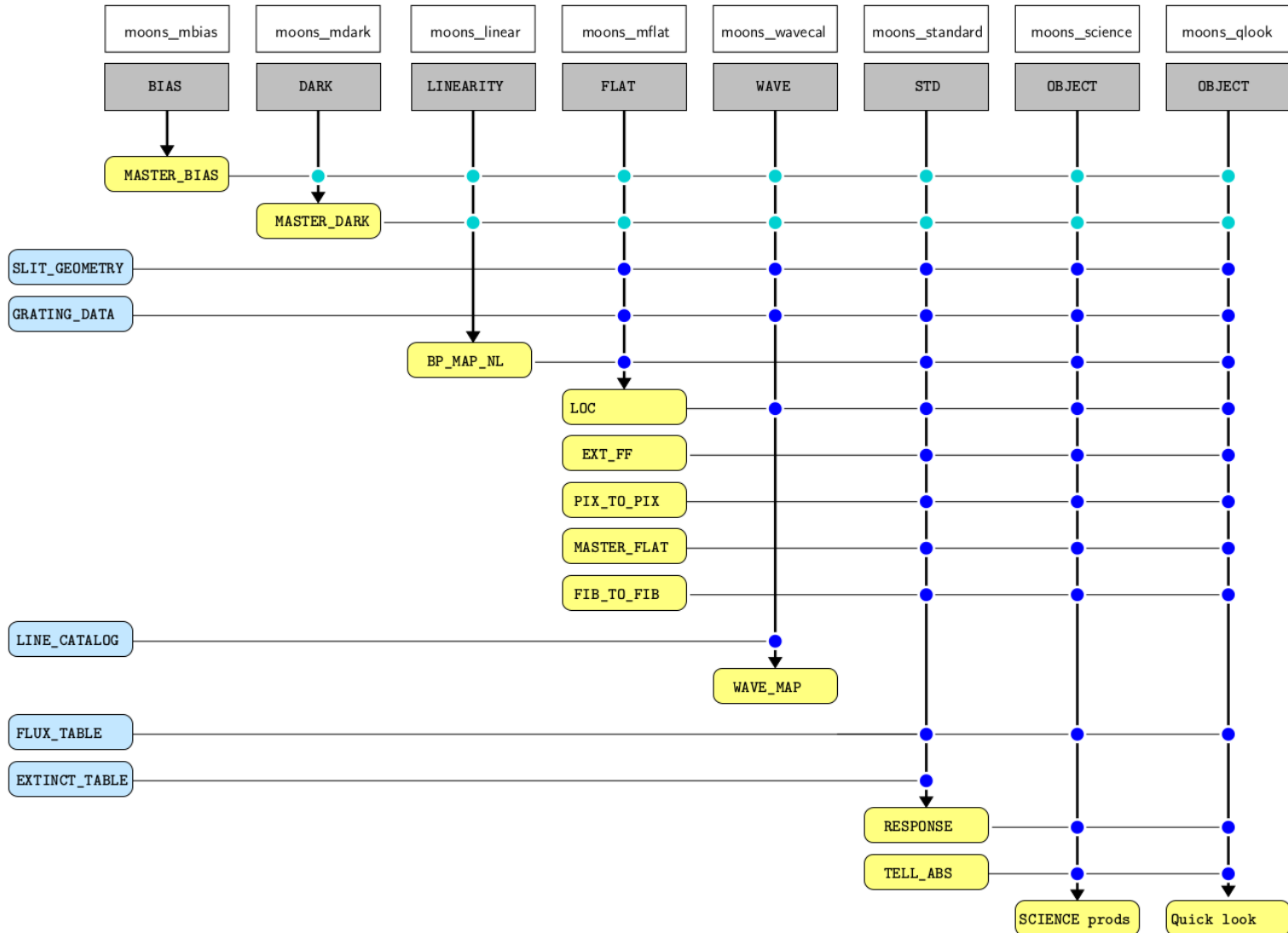
## 1. Cross beam switching (Xswitch)



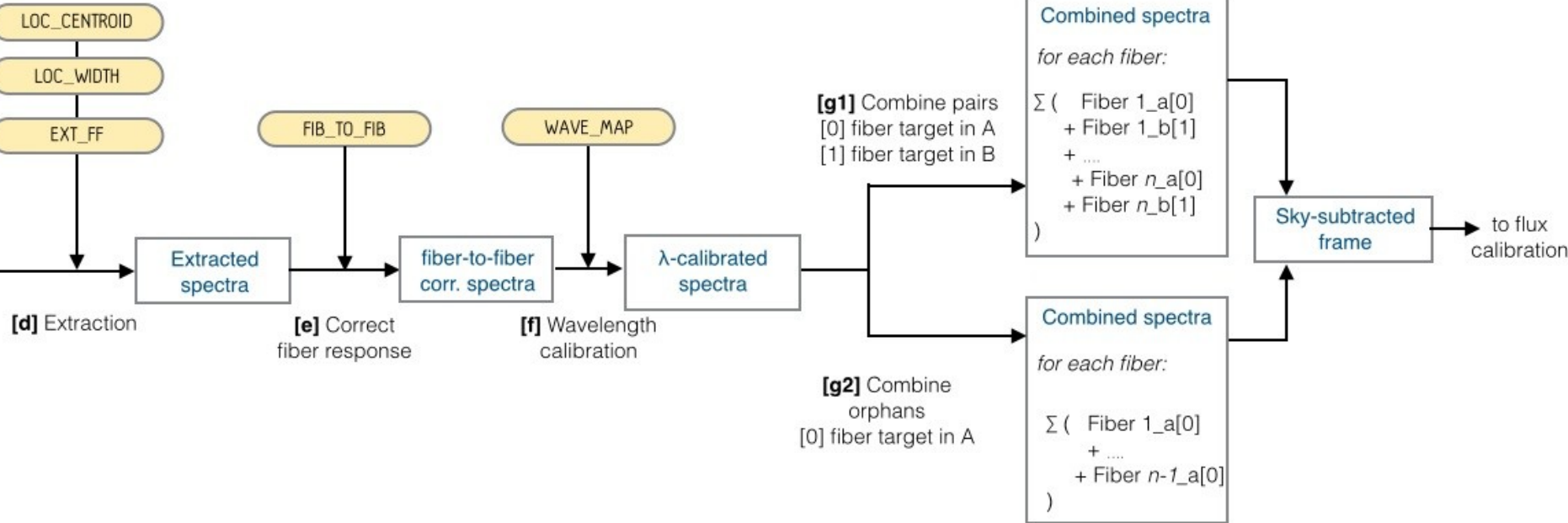
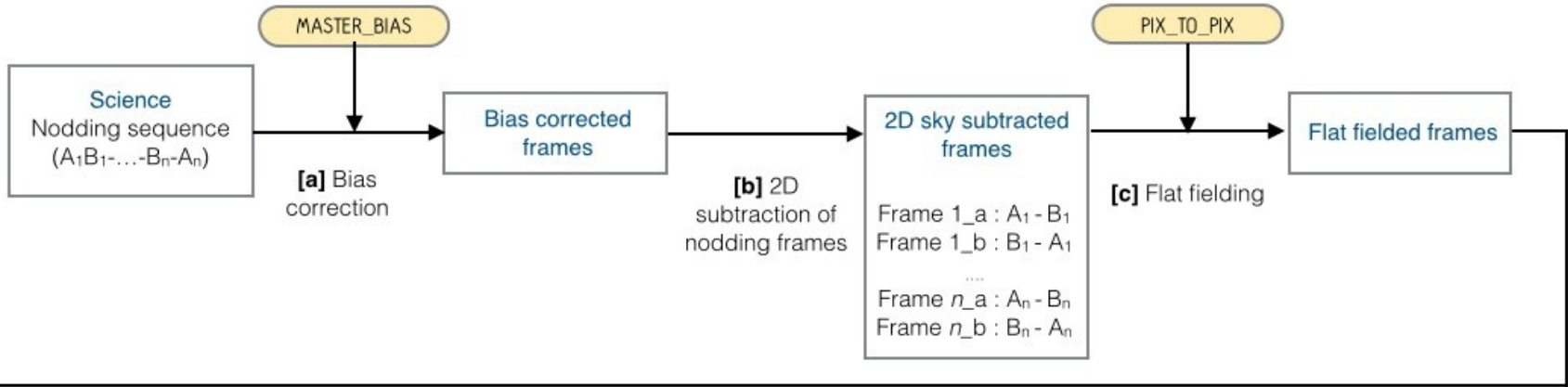
## 2. Stare + sky fibres

## 3. Stare + nod

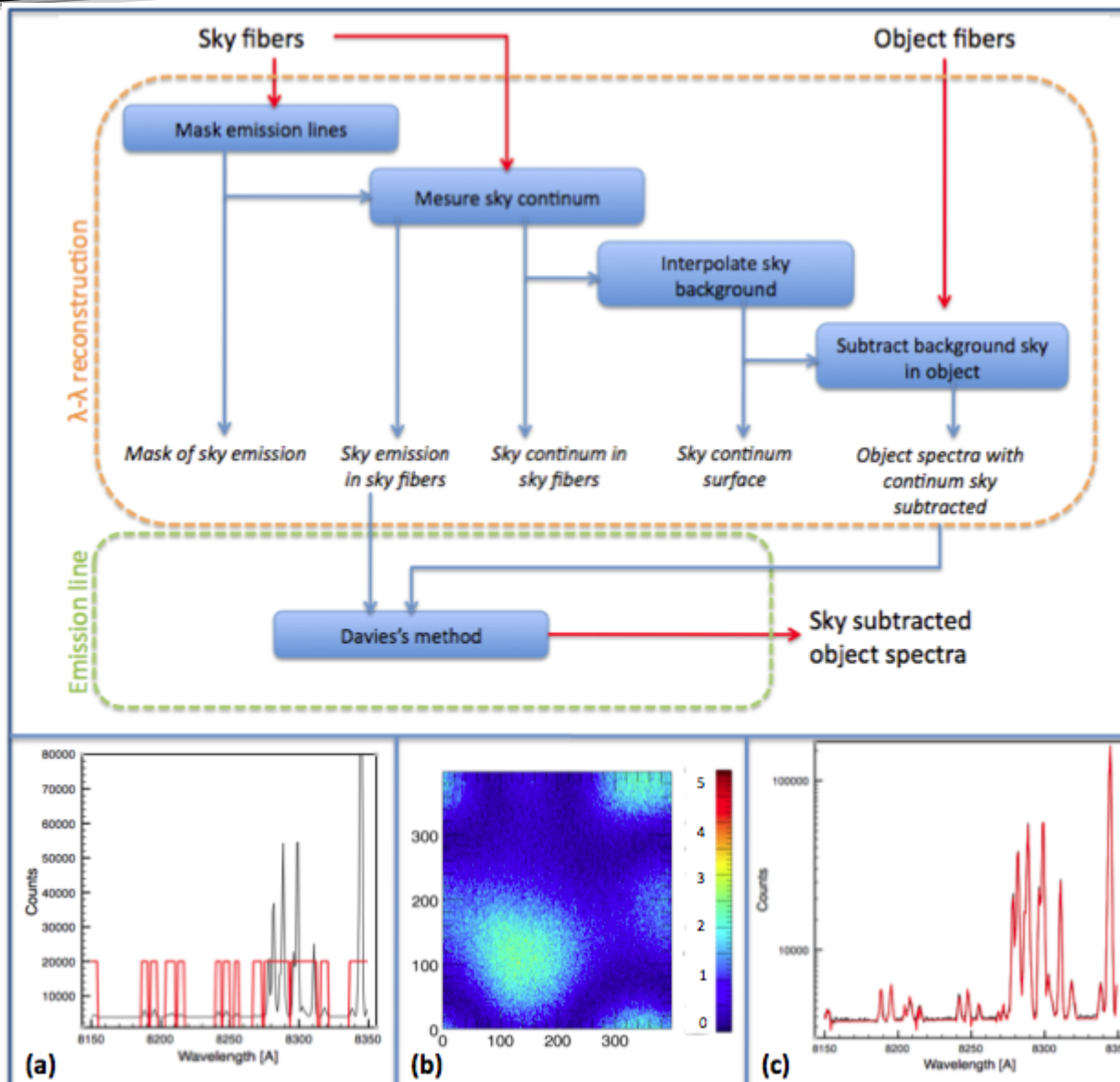
# Data reduction



# Xswitch





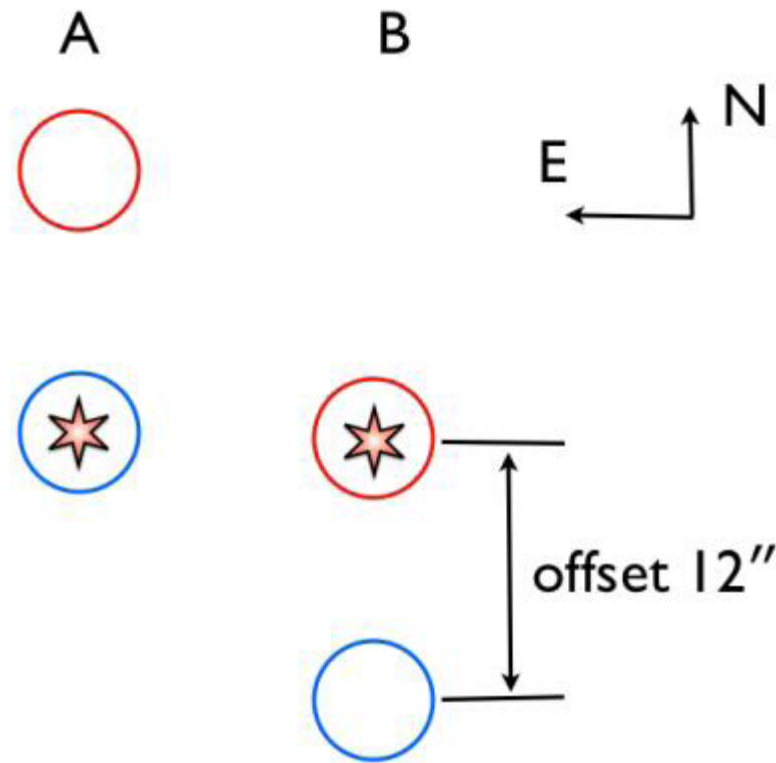


# Sky subtraction - tests

## FLAMES/GIRAFFE

- Medusa fibers
- Cross beam switching
- LR8 : 820-940nm –  $R=6500$
- 6×10min exposures (ABABAB)
- 31 galaxies from zCOSMOS
- 3 « pure sky » pairs
- ~28° from full moon
- Seeing ~ 0.9" – airmass < 1.2
- Attached flat-field

*Rodrigues et al. (2012, SPIE)*  
*Yang et al. (2013, Messenger)*

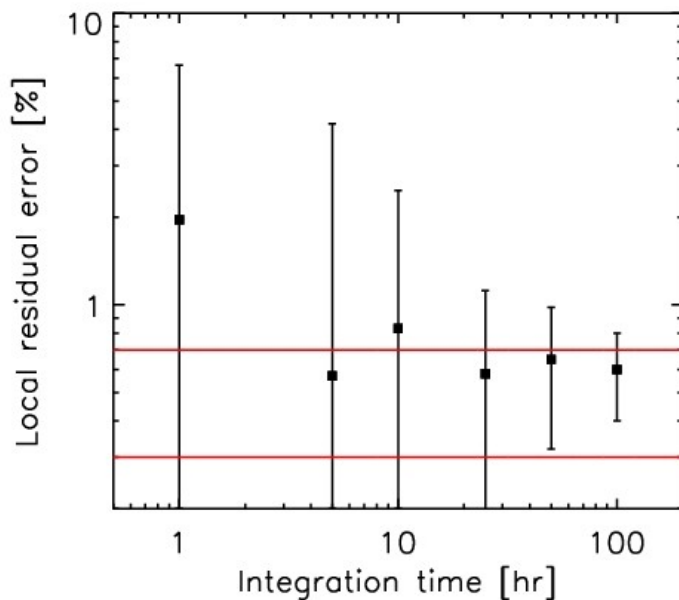
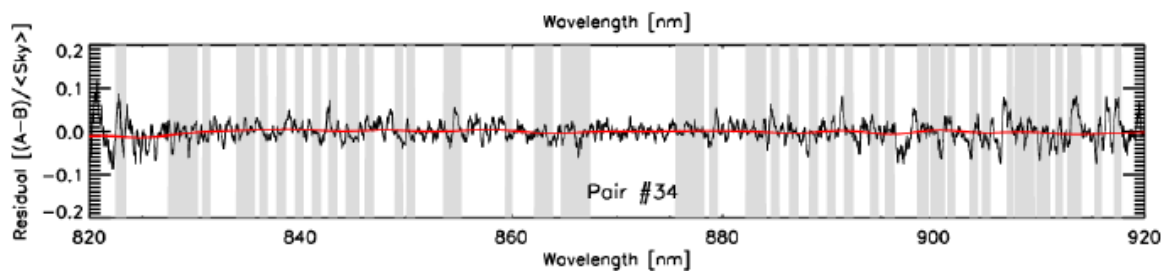
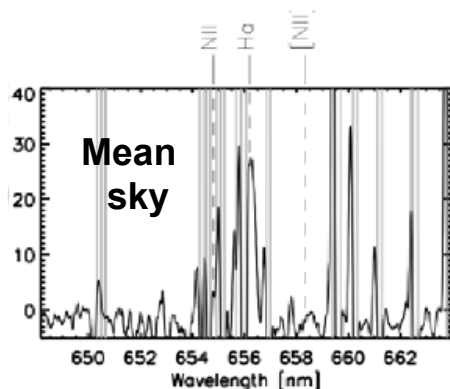
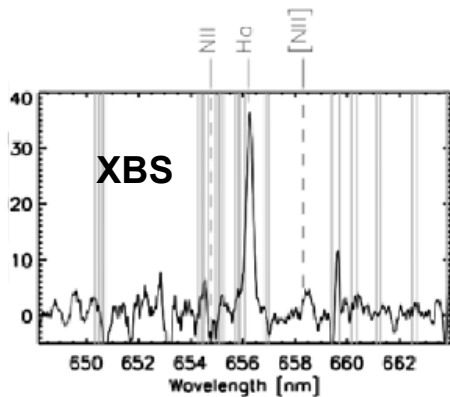


*Cross beam switching*

# Sky subtraction - results

I(AB)=22 with  
FLAMES in 1hr

With cross beam switching : accuracy **better than 1%** (Rodrigues et al. 2012)



Simulations of longer exposures (Yang et al. 2013)  
Mean accuracy : **0.6±0.2 %**

## Science products

- wavelength calibrated,
- sky subtracted
- flux calibrated 1D spectra for each allocated fibre
- +
- propagated noise (error) spectra
- propagated bad pixels mask
- +
- intermediate data

No analysis tool is part of the instrument pipeline.

# Survey / analysis tools

Tools required to analyse the amount of data generated by the survey !

Nothing defined yet

Suggestions and contributions are welcome

- Stellar objects
- Extragalactic objects

# Survey / analysis tools

- Rebinning
- Normalisation to the continuum
  
- Detection and measure of emission lines
- Radial velocity / redshift determination
- Spectral indices measurement
  
- Spectral fitting
- Stellar populations
  
- ...