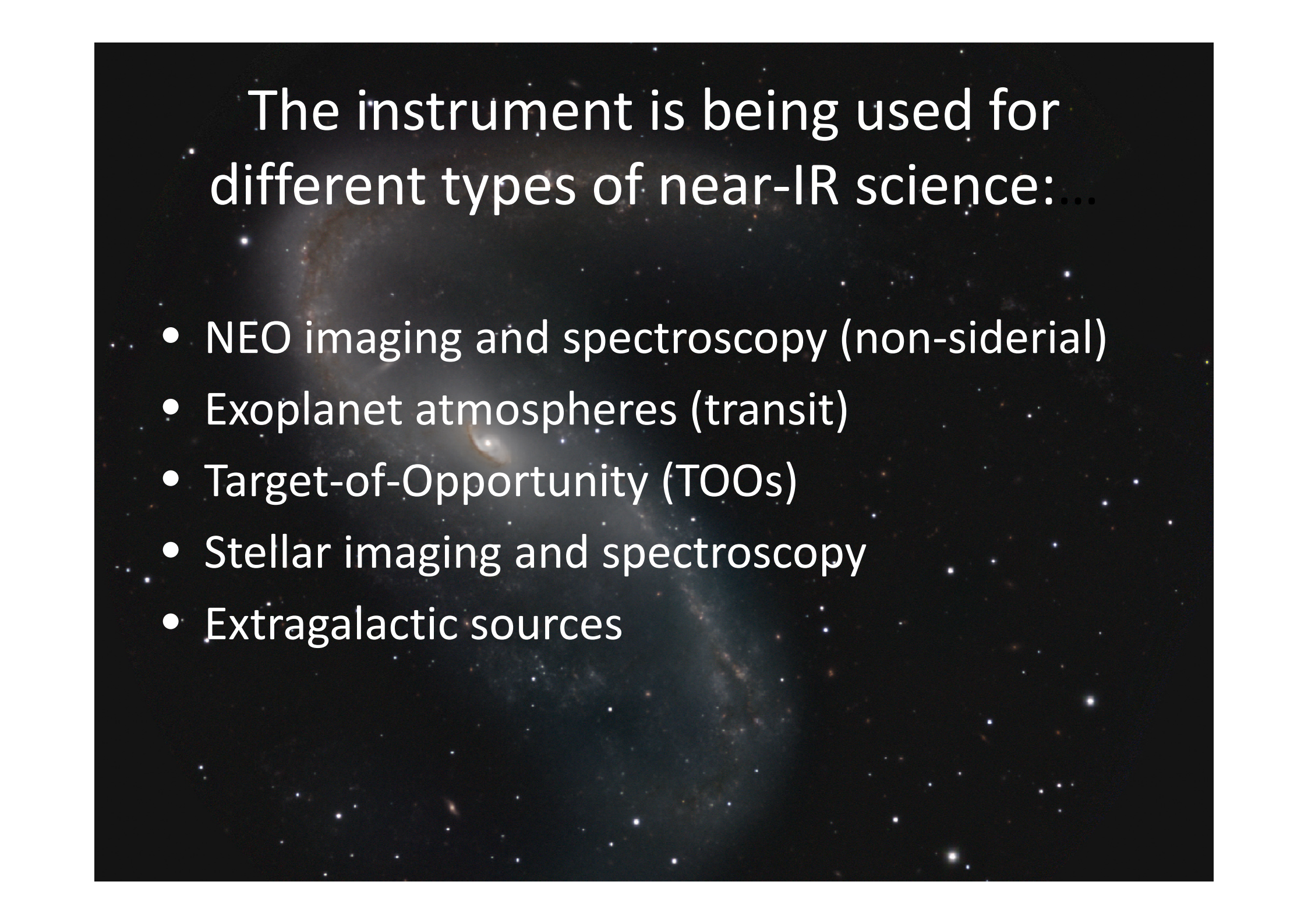




Flamingos-2 has been offered for
2 semesters at Gemini-South

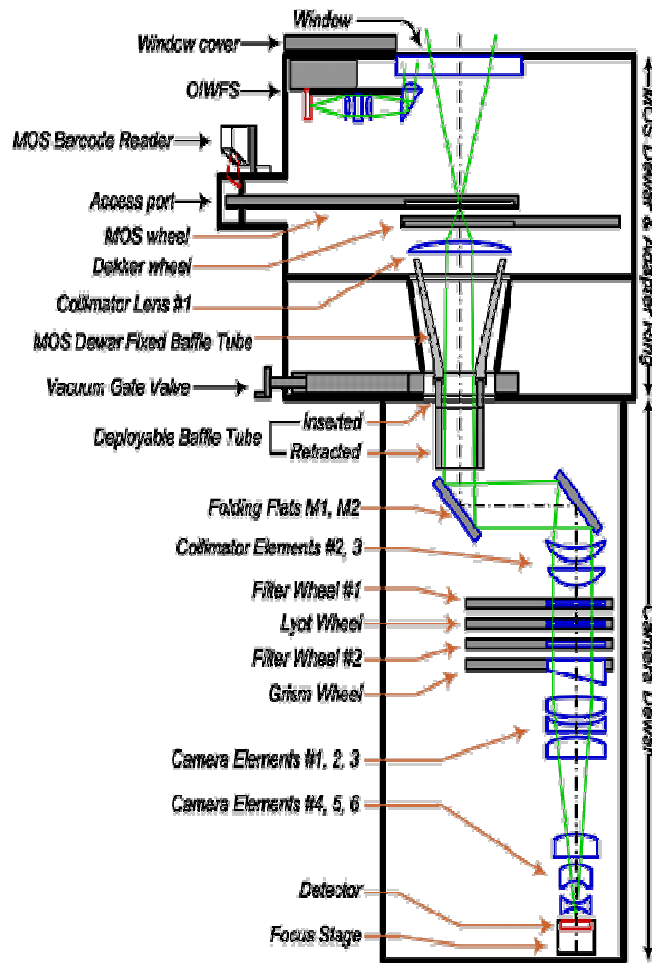
Percy Gomez on behalf of the F2 science team
Brazil 2014



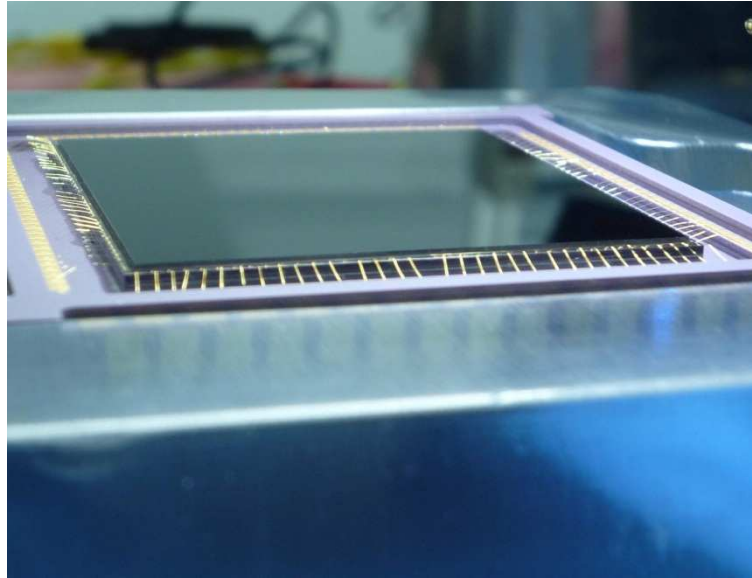
The instrument is being used for different types of near-IR science:...

- NEO imaging and spectroscopy (non-siderial)
- Exoplanet atmospheres (transit)
- Target-of-Opportunity (TOOs)
- Stellar imaging and spectroscopy
- Extragalactic sources

Flamingos-2 is a cryogenic imaging and spectroscopic instrument.

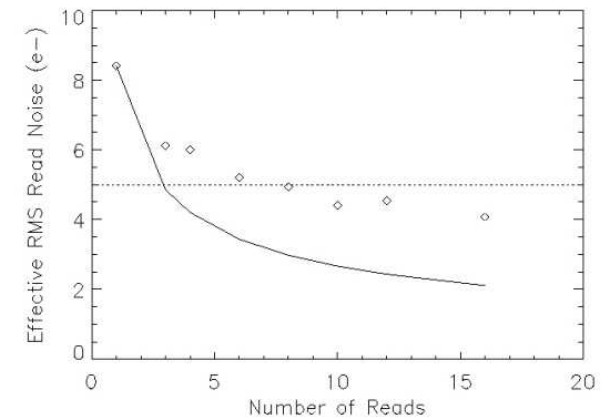
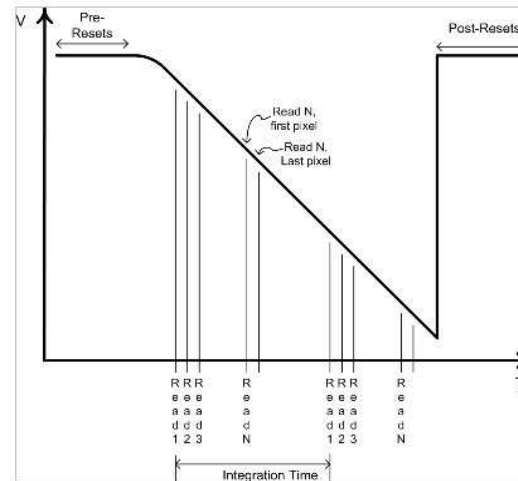
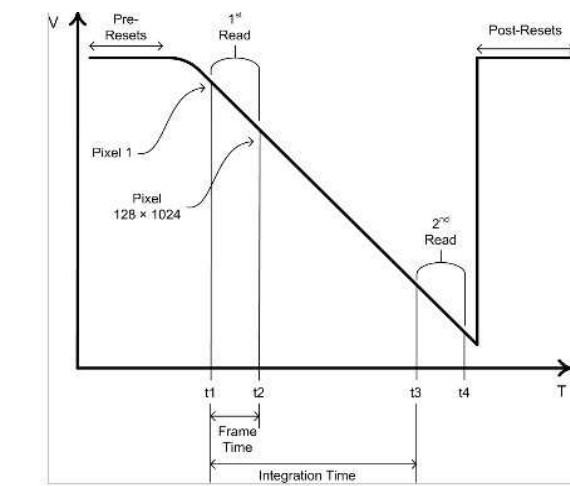


The Detector is a Hawaii-2 (HgCdTe)



- 2048x2048 pixels (0.18 arcsec/pix)
- Dark current = 0.5 e-/s/pix @ T=80K
- Linear <0.5% from ~4000 to ~21,000 ADU.
Saturation is reached at ~35,000 ADU or ~145ke-
- Please remember that in a **15 seconds Ks exposure** the sky reaches **half way to the linearity range**.

We use different readmodes to reduce readnoise



MEF fits files:

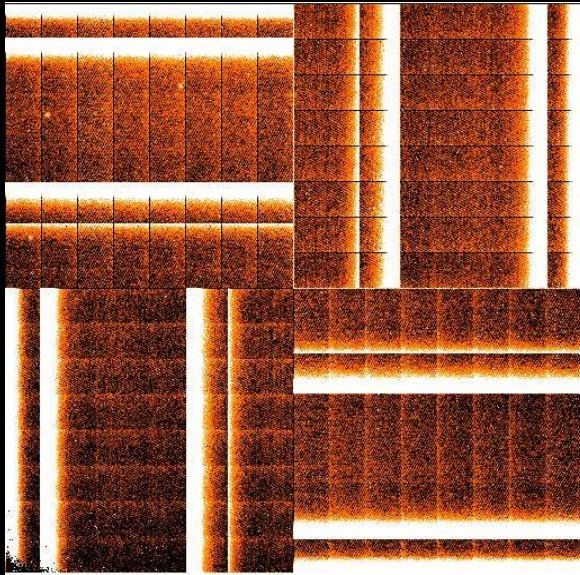
[0] has the generic info.

[1] pixel data:

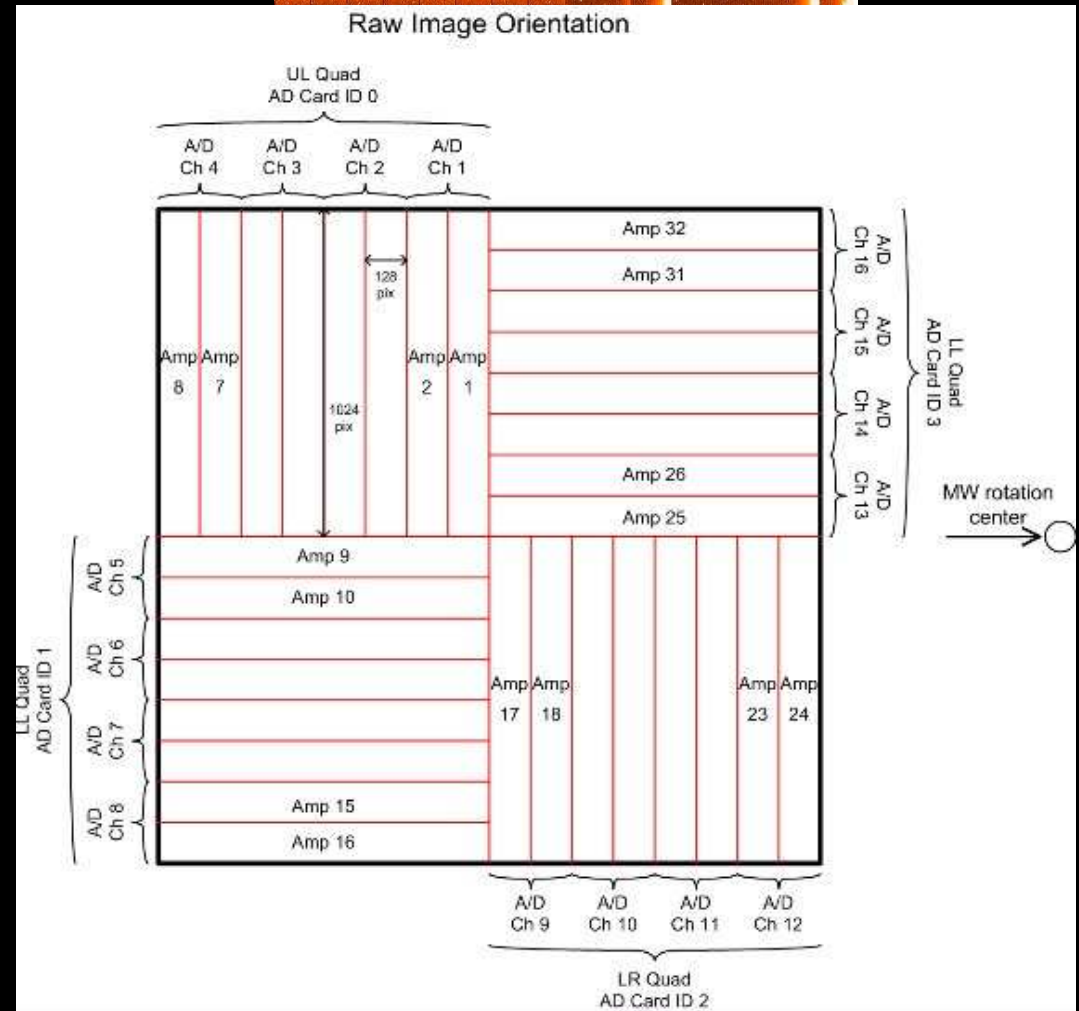
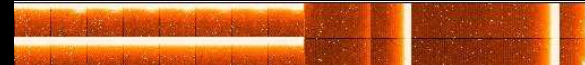
$\text{CDS} = \text{First_read} - \text{Second_read}$

$\text{MDS} = \text{Sum of First_Reads} - \text{Sum Second_Reads}$

This is how the data look like (darks)



3 seconds CDS



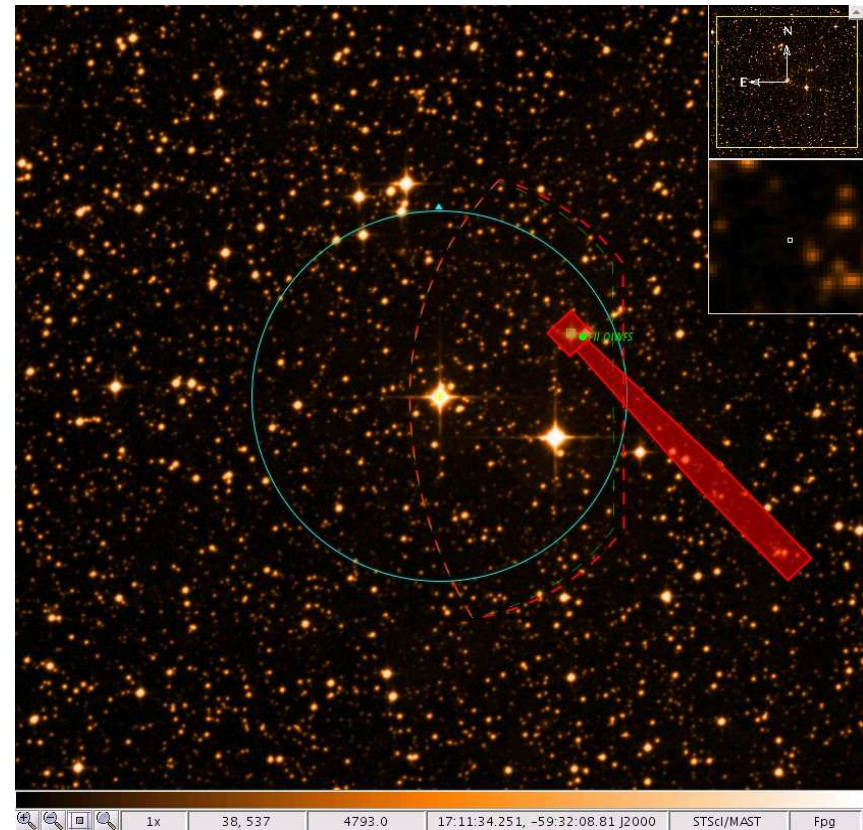
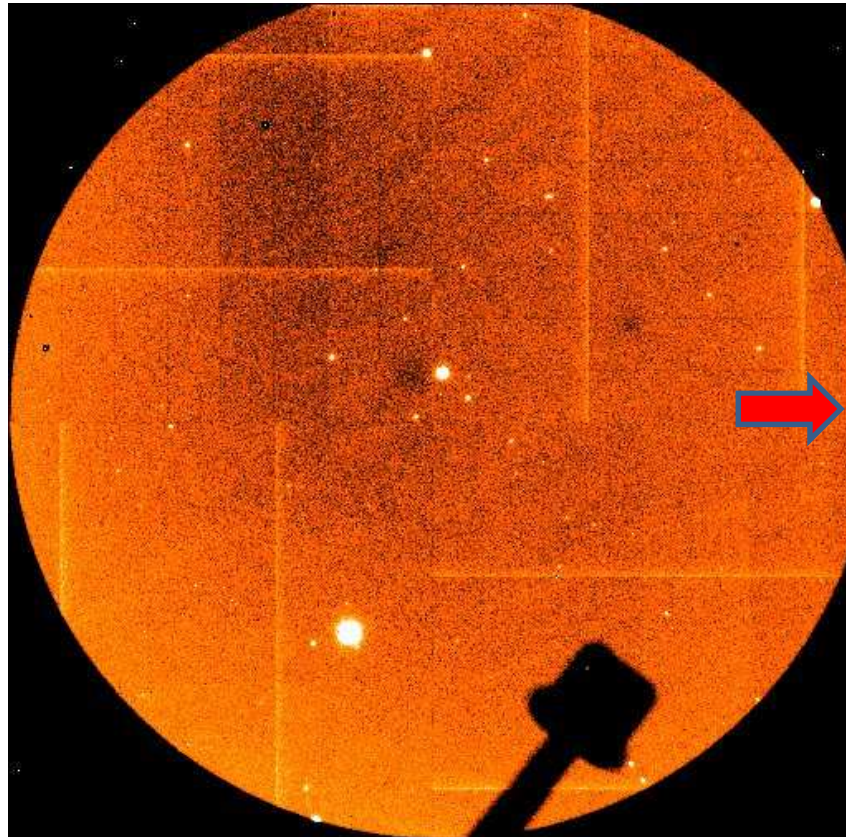


Several modes makes it a very useful instrument for the Gemini community

- Imaging:
- Long Slit Spectroscopy:
 - 6 permanent long slits
 - 950 and 2600 effective resolution grisms
- MOS Spectroscopy (to be commissioned in 15A)

Imaging: Y, J, H, Ks bands

PA = 0 degrees



FOV has 6 arcmin diameter

Sky subtraction is key in the near-IR

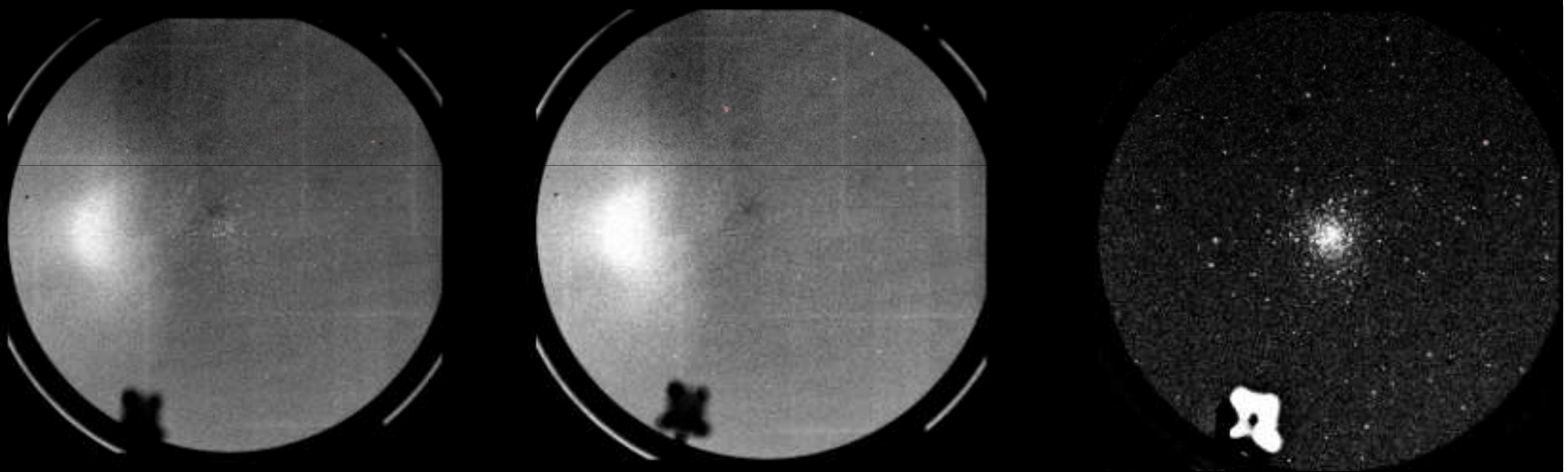
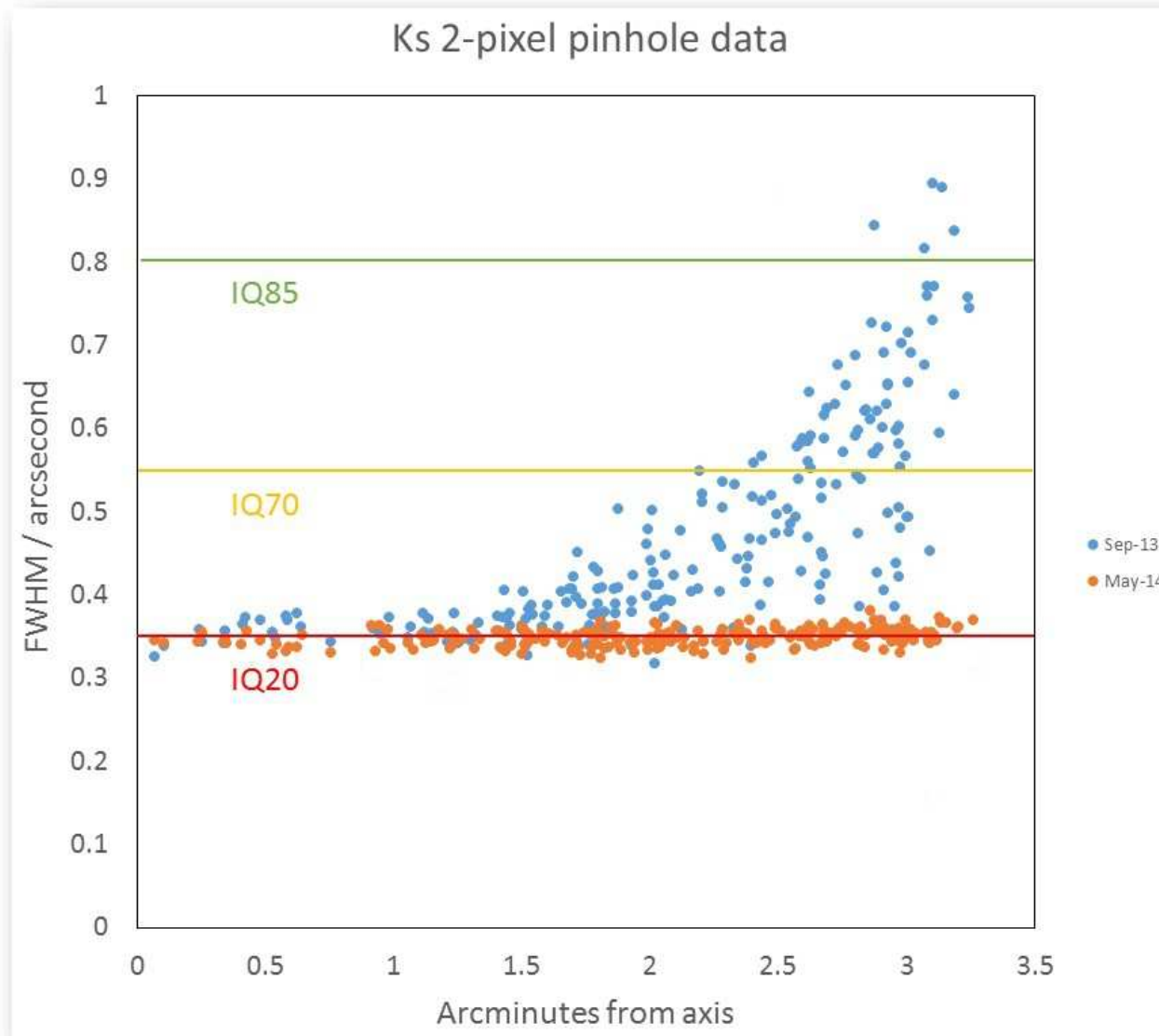


Image Quality problem fixed



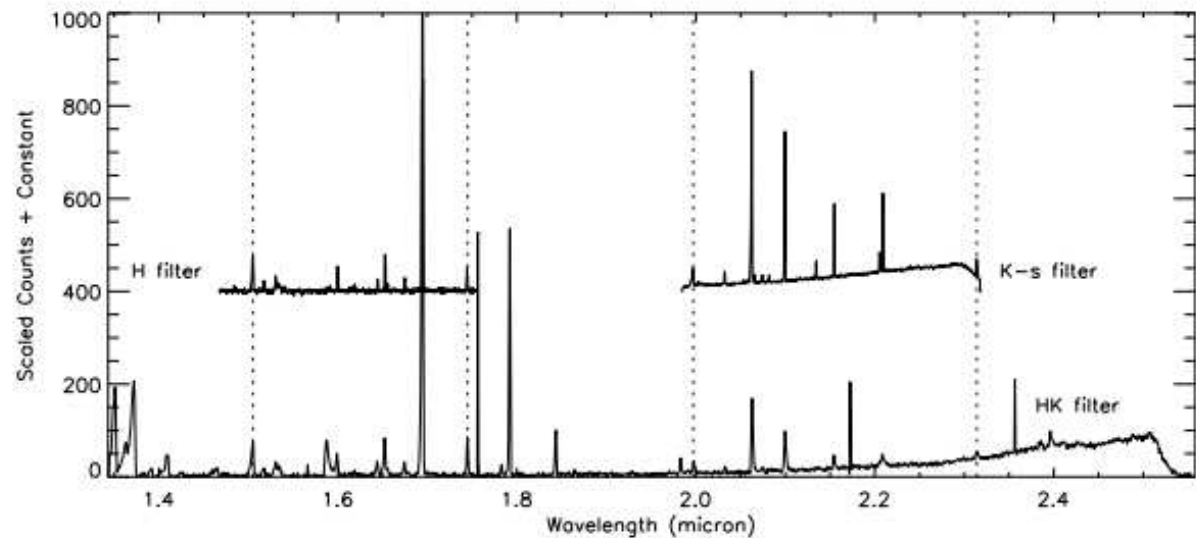
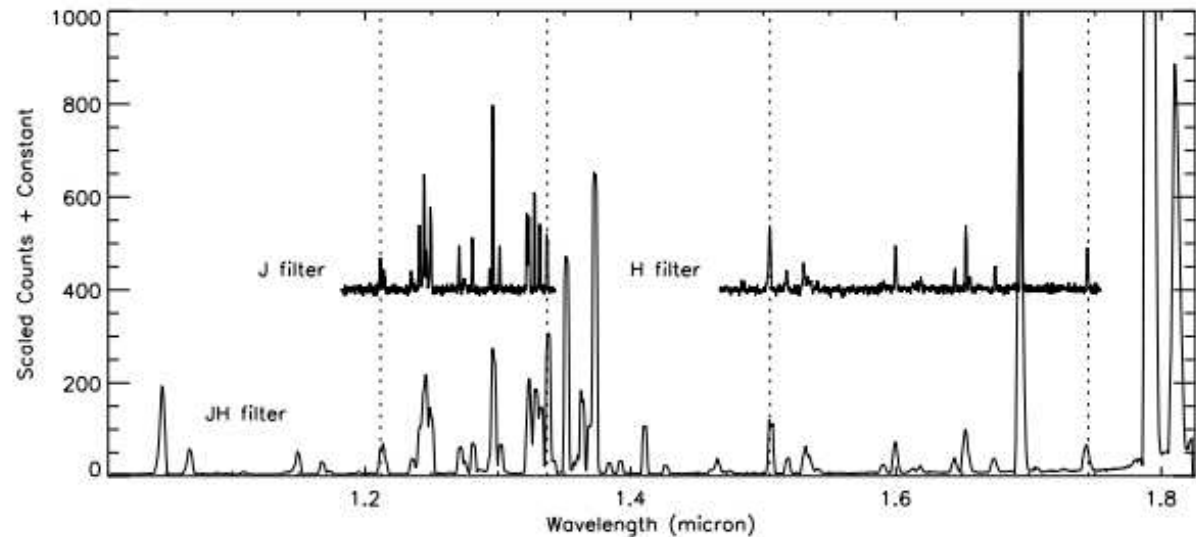
Similar sensitivity between NIRI and F2

s/n=5 in 1 hour

Band	F2	NIRI	MOIRCS
Y	22.2		24.6
J	23.5	23.5	24.0
H	22.7	22.5	23.2
Ks	22.8	22.6	22.8

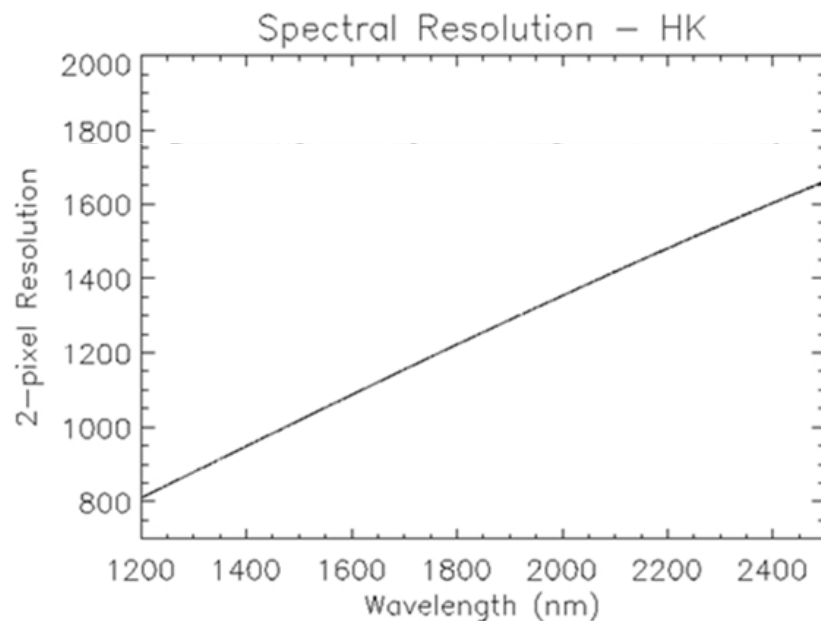
Long Slit Spectroscopy

- JH and HK grisms with ~ 900 effective resolution
- 2500 resolution grism + Y, Jlo, J, H, and Ks filters
- 4.4 arcmin long slits: 0.18", 0.36", 0.54", 0.72", 1.08", and 1.44" wide.

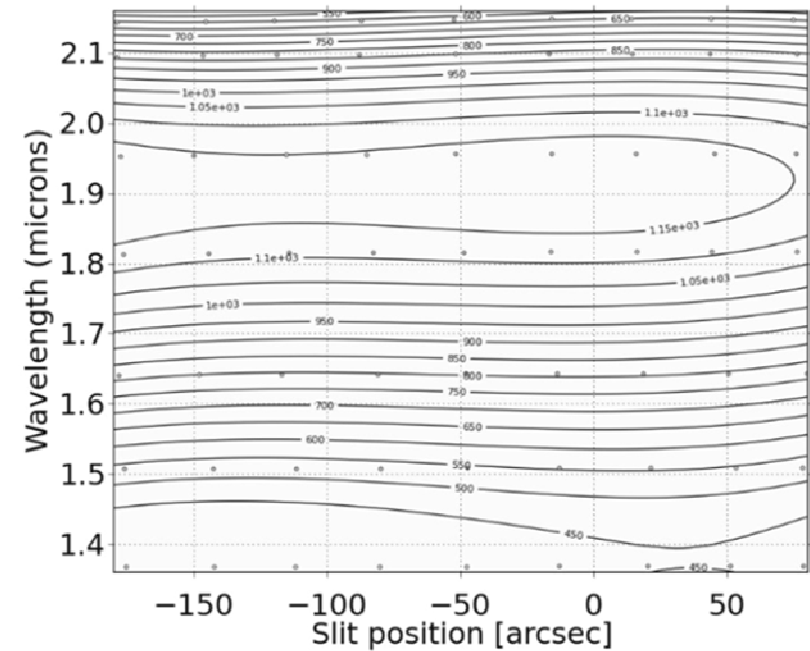


Spectral Resolution shows chromatic aberration

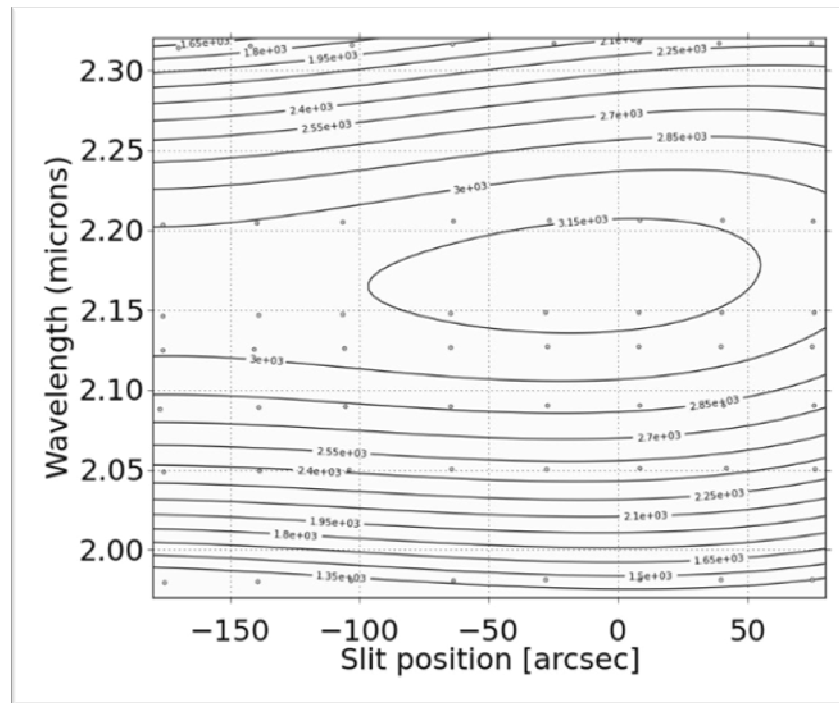
2013



2014



Similar effect in the R3K grism



Some UF2Os

Reflections

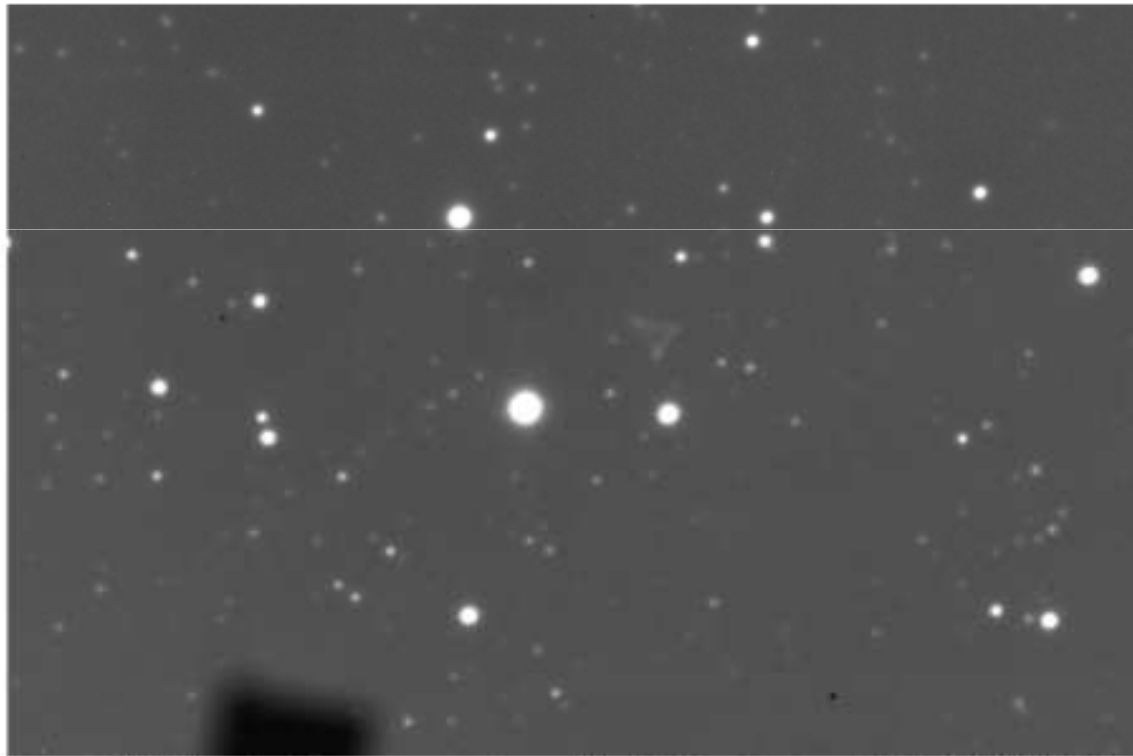


Image 5.2: Triangular feature present in raw Y and J-low data (e.g., S20130428S0159.fits, dark subtracted for clarity)

P2 vignettes the FOV

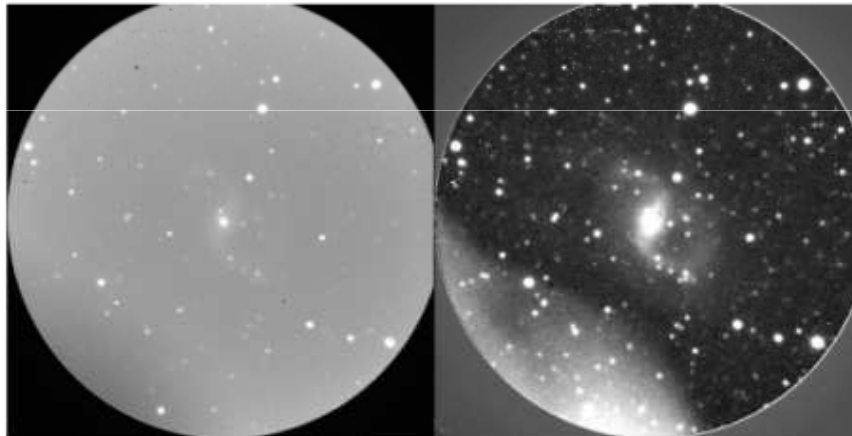
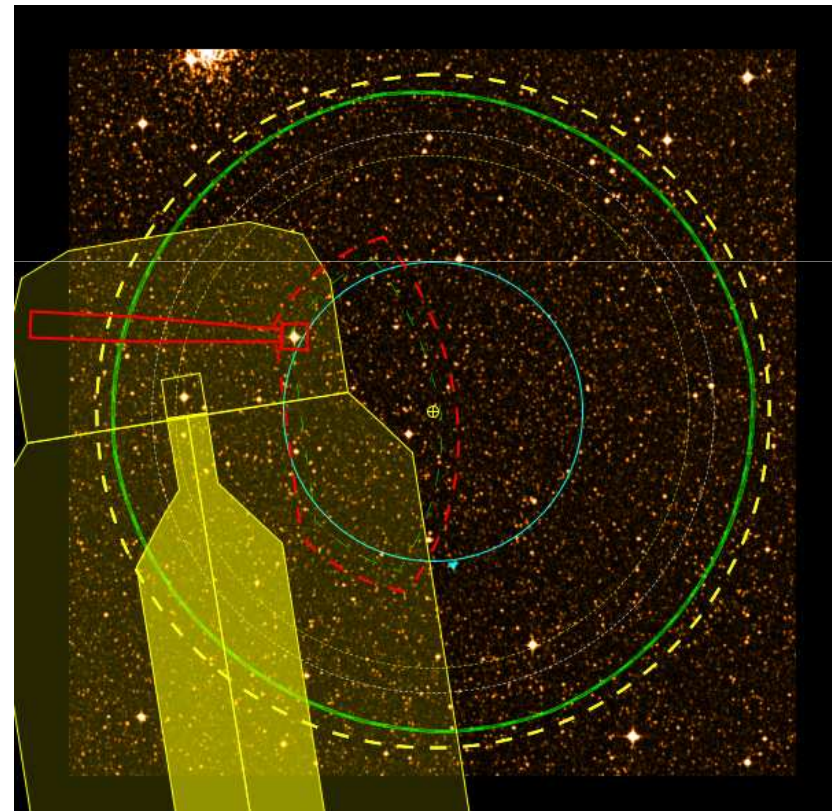


Image 5.1: Left: S20130427S0211.fits [dark subtracted, flat divided]. Right: S20130427S0211.fits [dark subtracted, flat divided, sky subtracted].



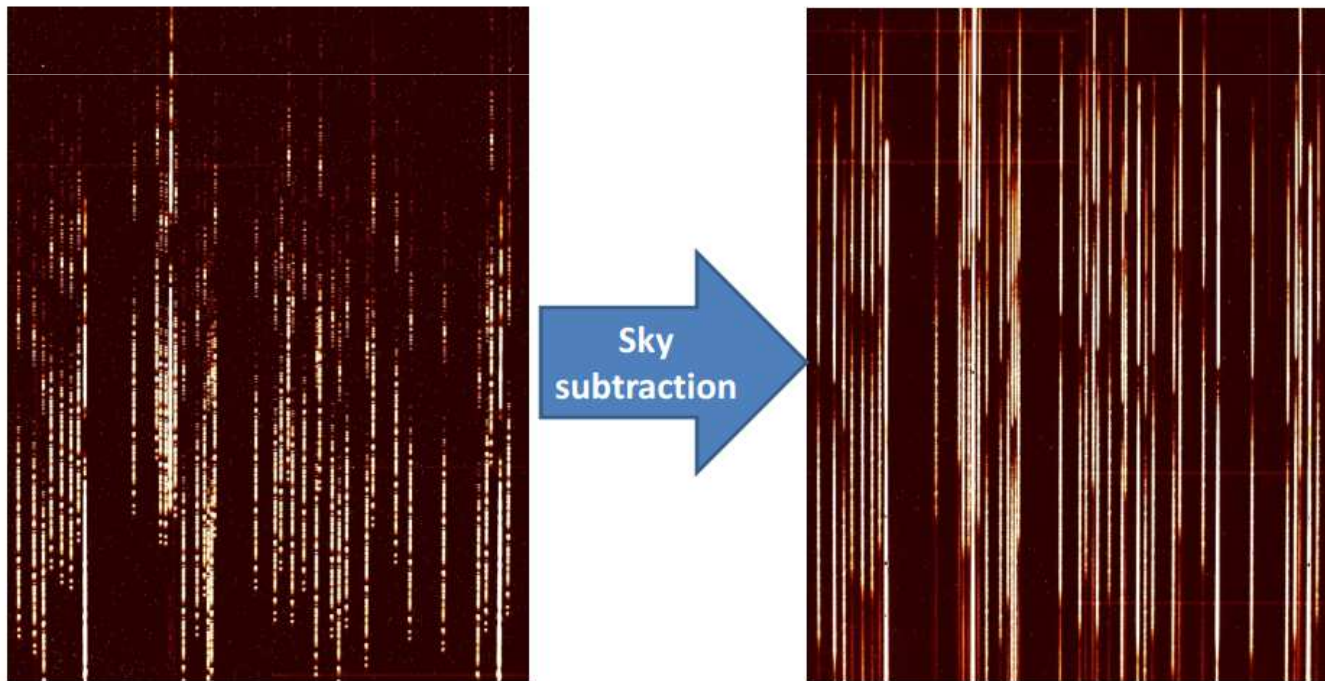
Continue troubleshooting ...

issue	effect
Decker wheel fails	Vignetting
Gate valve baffle malfunction	High background in K-band spectroscopy
Lyot wheel malfunction	Flux loss

Improvements on the way ...

- OIWFS commissioning (ready for mid 14B)
- Chromatic aberration fix (high priority)
- Troubleshooting mechanical malfunctions
- K band filter for higher spectroscopic resolution (for 15A)
- MOS checking and commissioning in 15A
- *MOS mode to be offered during 15A (fast turnaround programs?)*

The Road to MOS



- **Multi-Object Spectroscopy mode commissioning started in December 2012**

It has taken many people to get F2 operational ...

