DRM Update

Joe Liske

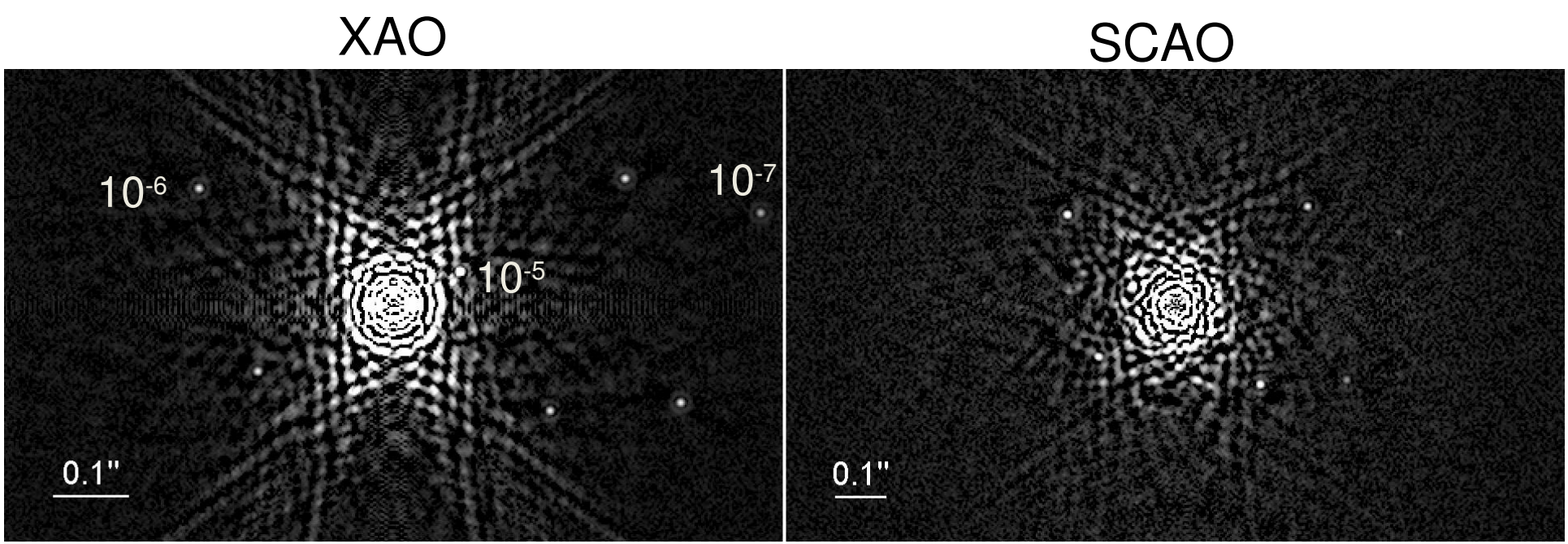
S3-1: Direct imaging of exoplanets

Szymon Gladysz

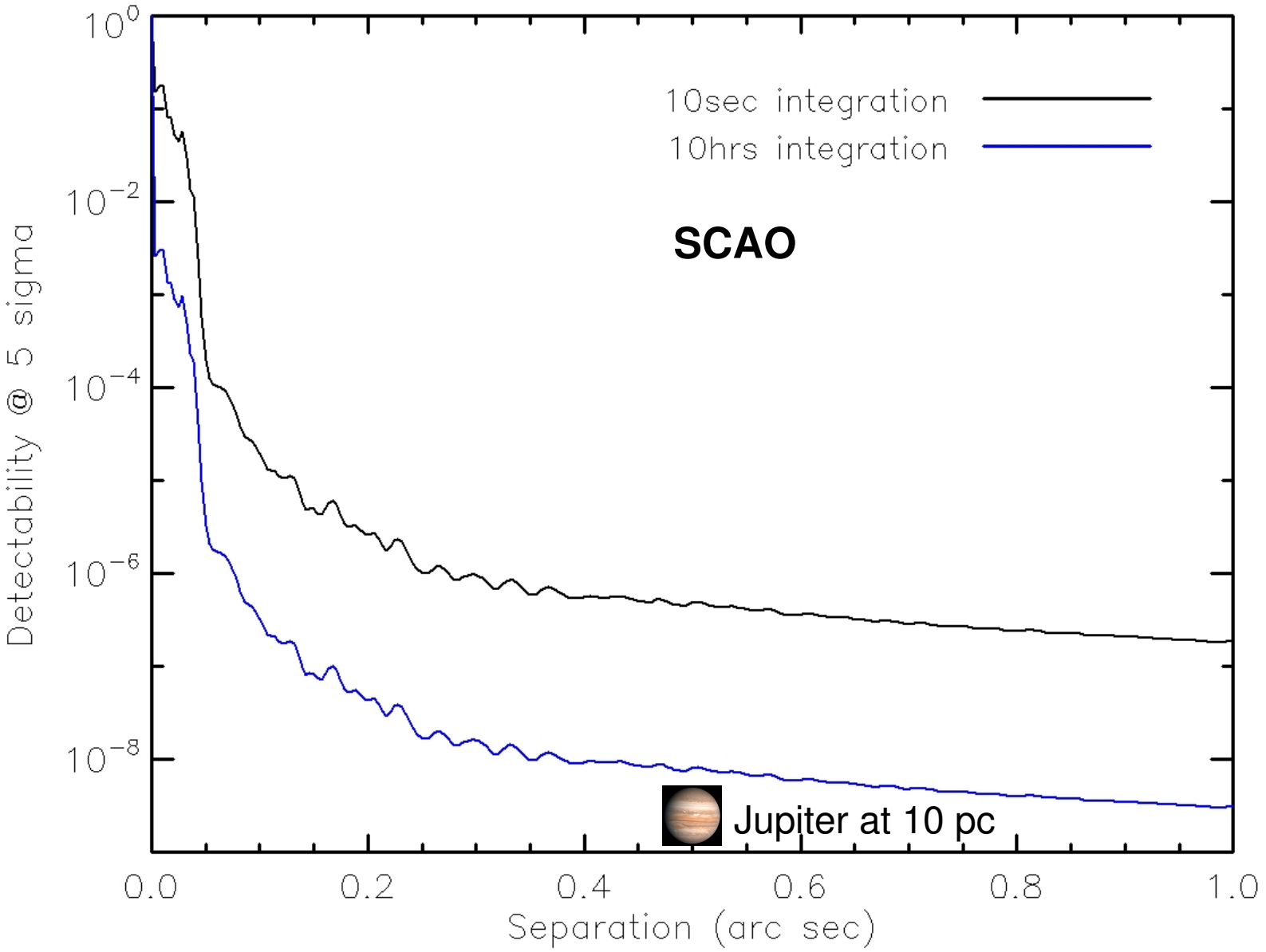
Comparison between high-contrast imaging with XAO and with the telescope's SCAO.

Same planets, same atmosphere, same aberrations, same telescope, same exposure time (10 seconds).

Different IFUs (spectral ranges).



S3-1: Direct imaging of exoplanets



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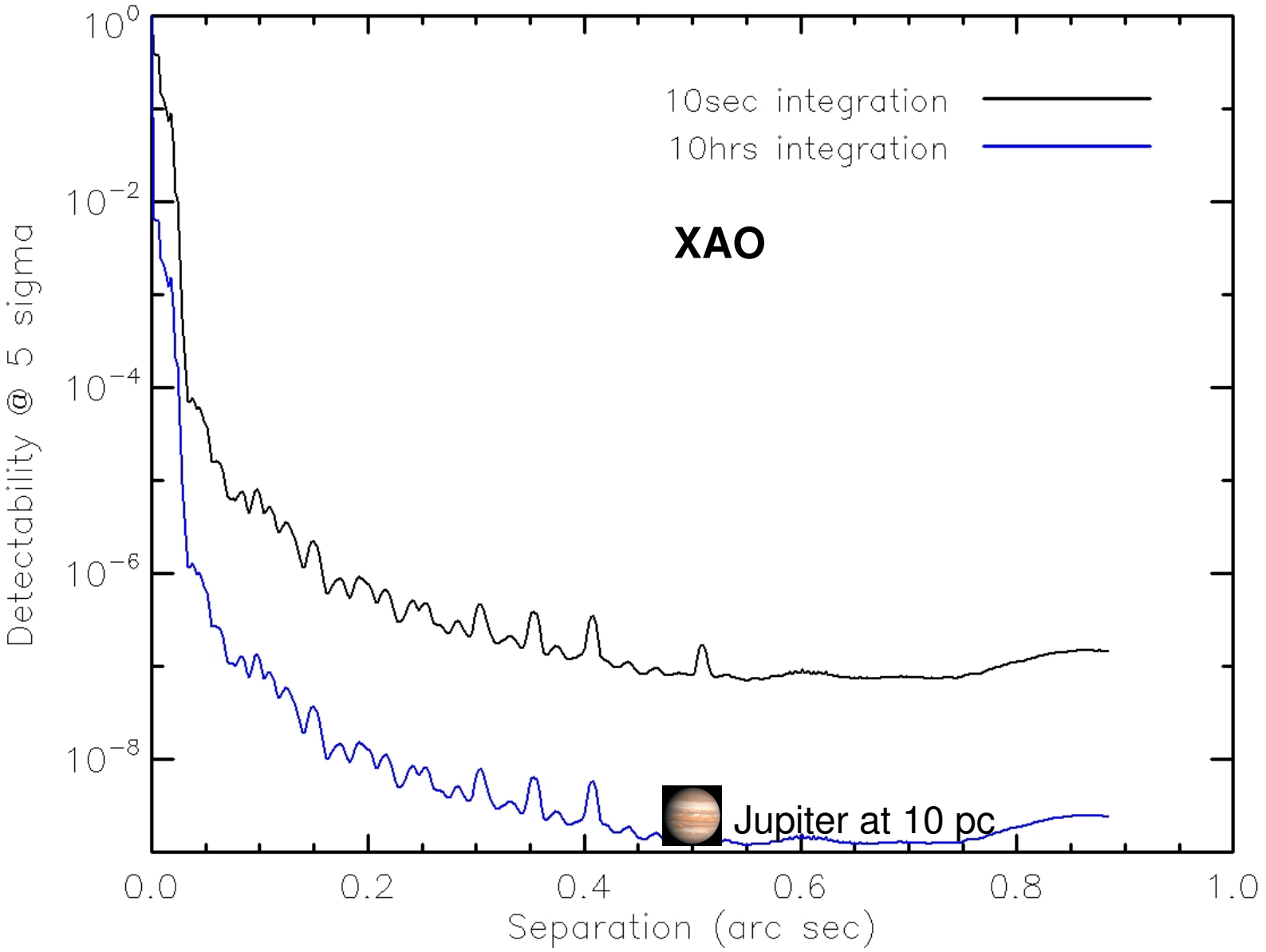


S3-2: RV detection of exoplanets

- Dominique Naef has been recruited to “translate” the DRM work of the Geneva group (see previous presentations by S. Udry) into a DRM report. Started 01 Oct.

S9-1: Imaging of circumstellar disks

Daniela Villegas

Model (C. Pinte)

Star: TTauri, 3900°K, $3R_\odot$

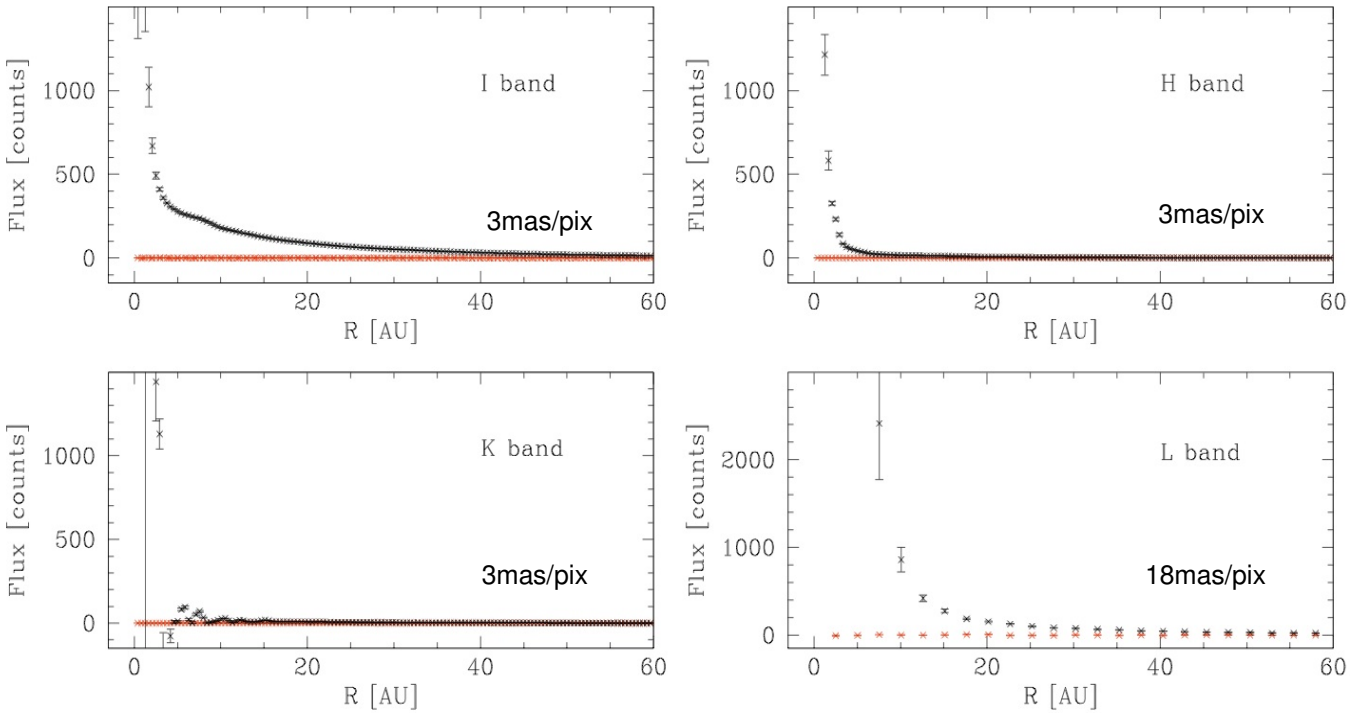
Disk: - face-on, 10^{-3} $M_\odot$

- R_{in}= 0.8AU
- R_{out}= 400AU

Gap: - Gaussian shape

- R = 10AU
- width = 2AU

Disk Detection: 140pc, image PSF known



Gap detection

2AU gap -> ~5pix at 140pc (IR only)

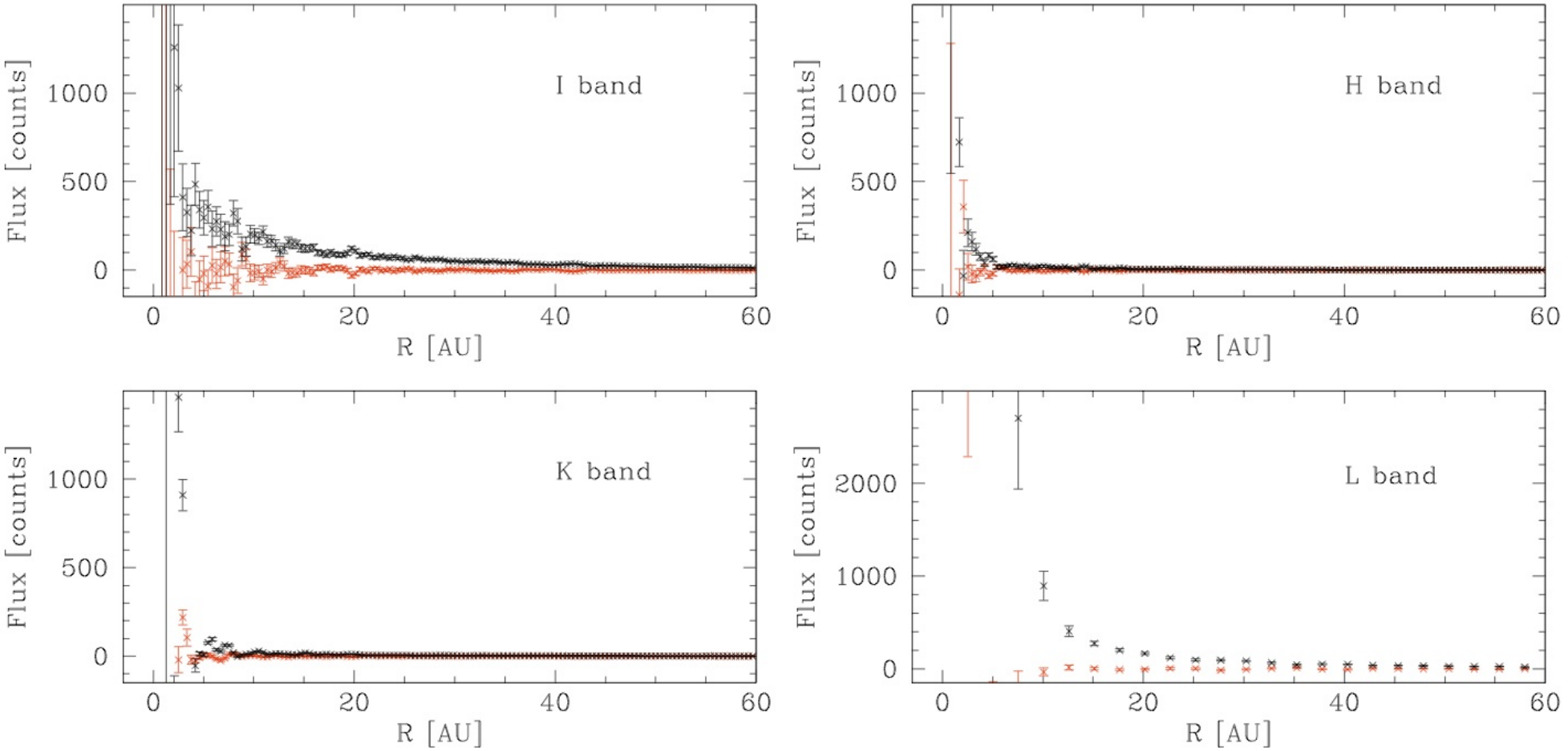
Requires the use of precise deconvolution techniques.

Currently testing best deconvolution approach.

- Imposes requirement on minimum exposure time of instruments (~0.01s in K band).
- Requires good PSF knowledge to be feasible at larger distances.

S9-1: Imaging of circumstellar disks

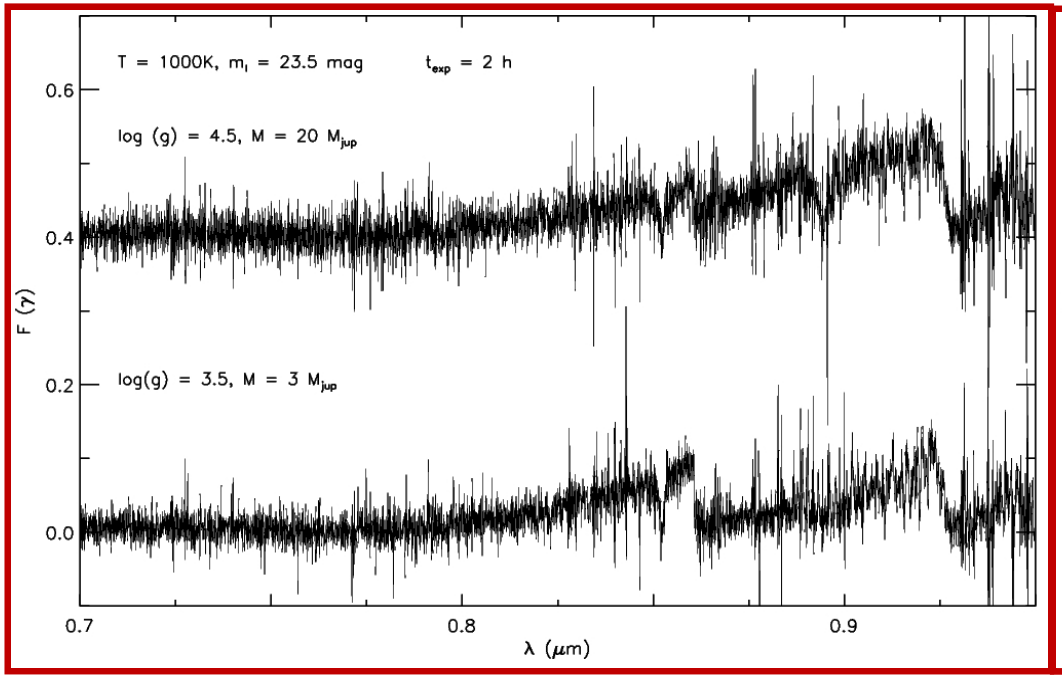
Disk Detection: 140pc, image PSF rotated by 90 deg

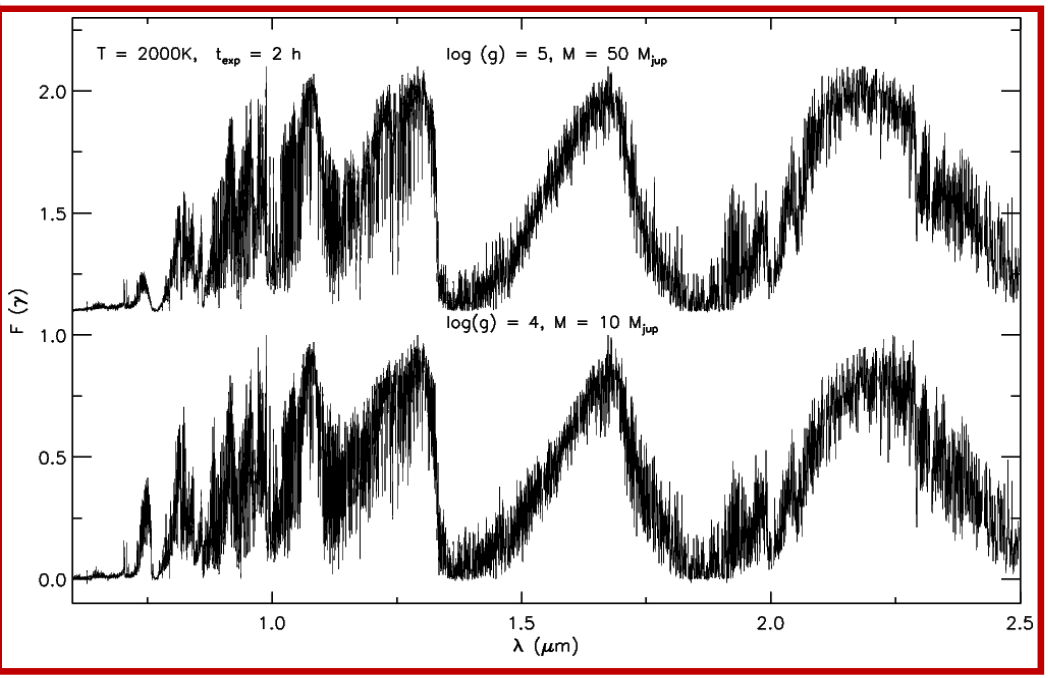


S5-1: Characterizing the lowest mass free-floating objects in star forming regions

Annalisa Calamida

- Simulations in progress.
- Gravity effects observable in R ~ 4000 spectra of planetary mass objects in star forming regions at DM ~ 6 mag.
- Details of analysis still need to be clarified.

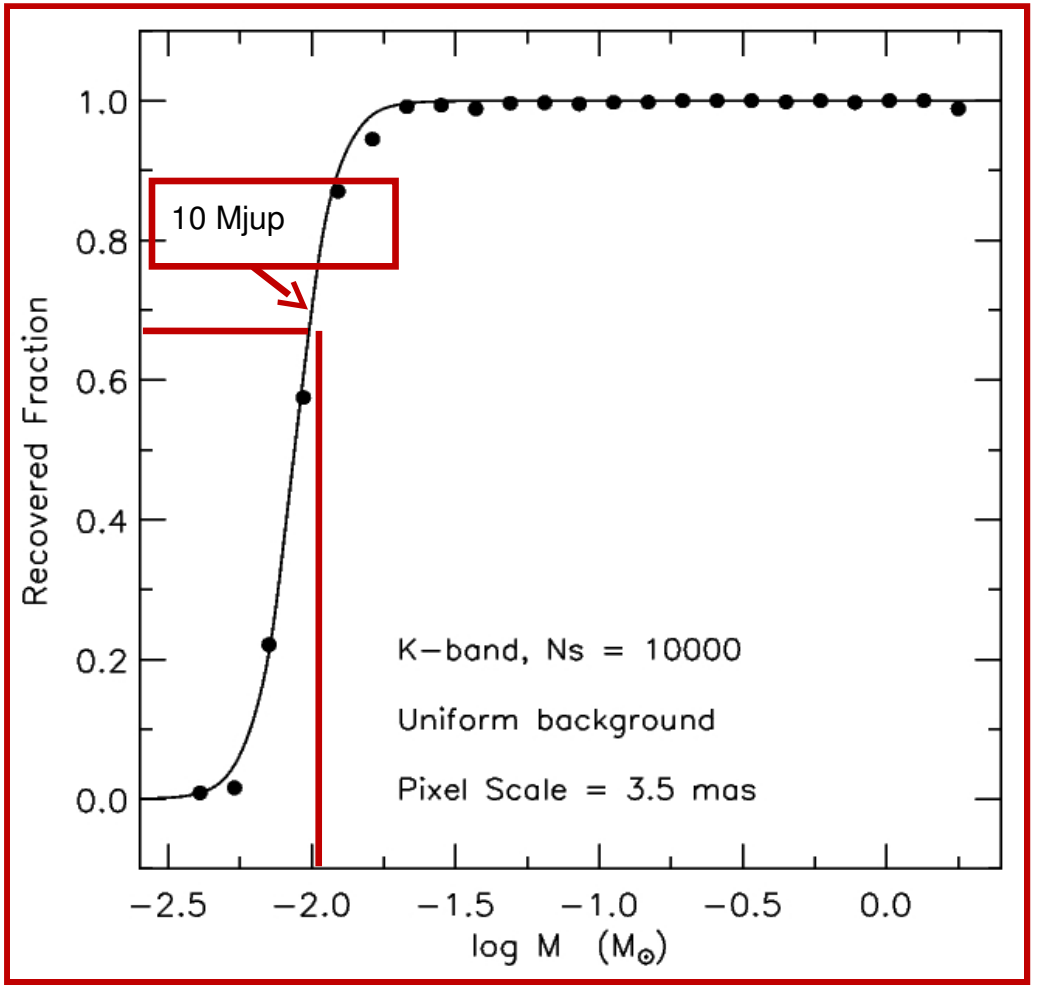




S5-3: Giant planet-mass objects in the LMC

Annalisa Calamida

- Nearly complete (90% for 17-24 M_{jup}) sample of BDs above the deuterium-burning limit in LMC and possibly in other galaxies.
- Planetary mass objects (< 10 M_{jup}) in the LMC in favourable conditions.
- V1 of report online.



G4-2: The chemo-dynamical structure of galaxies

- Report in progress.
- See presentation by G. Battaglia.

G4-3: First stars relics in the Milky Way and satellites

Gael James

- New PI? Sofia Feltzing.
- New simulator: Gael James has been recruited to work on this case.
- All tools for simulation and analysis already in place.
- Gael and Sofia to define set of questions to be answered by simulations.

G9: A survey of black holes in different environments

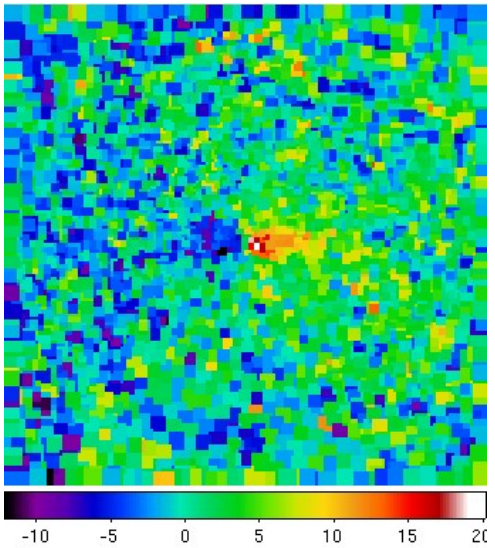
Aybuke Kupcu Yoldas

Realistic IFU simulations:

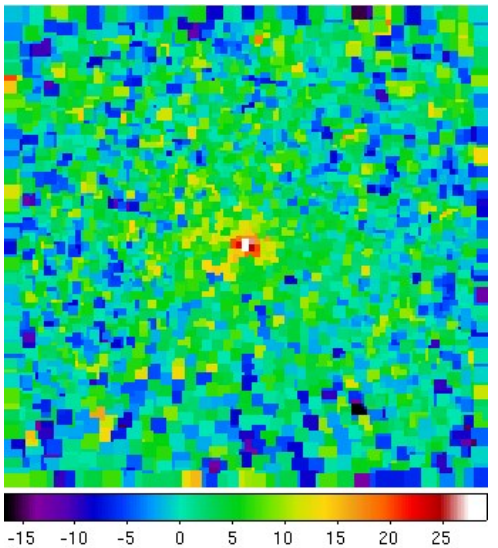
- including telescope + atmosphere + instrument + noise
- 5 - 10 mas spaxels
- I, z-J, K bands
- Different distances:
  - Virgo cluster (16 Mpc)
  - z = 0.2
  - z = 0.1
  - z = 0.05
- Different BH masses:
  - 10^7 $M_\odot$
  - 2 x 10^8 $M_\odot$
  - 3 x 10^9 $M_\odot$
- Different galaxy morphologies:
  - Dwarf elliptical (NGC4486 like)
  - S0 spiral (NGC5308 like)
  - Giant elliptical (M87 like)

Kinematic analysis:

- Penalized Pixel fitting (pPXF, Cappellari & Emsellem 2004)
- Difference of velocity maps with and without BH
- Difference of velocity dispersion maps with and without BH



Velocity difference map



Sigma difference map

1.25 x 10^7 $M_\odot$BH @ 16 Mpc

5 mas spaxel, LTAO, K-band, ~2 h exposure time

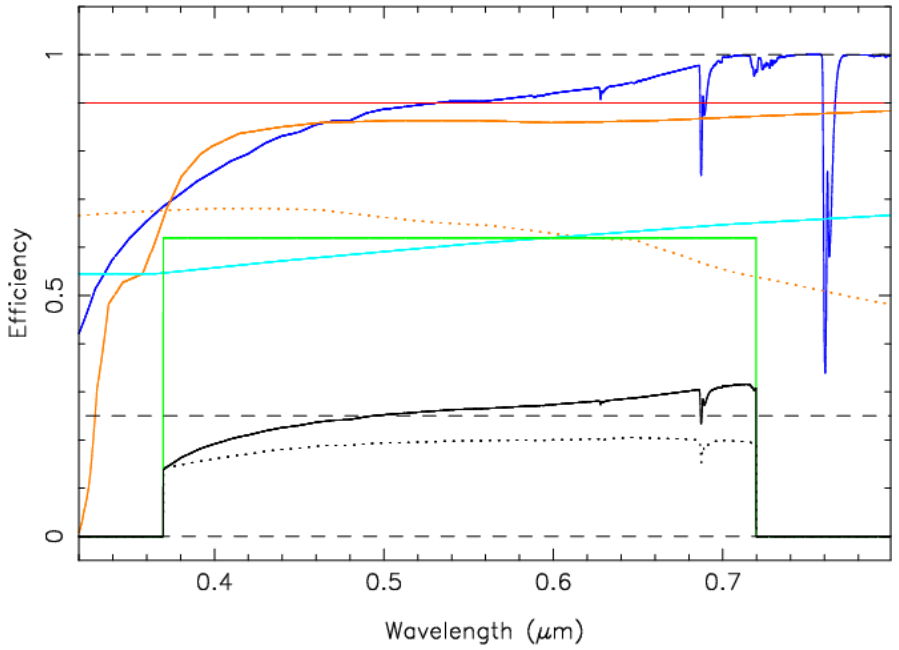
C4: The highest redshift galaxies at z > 6

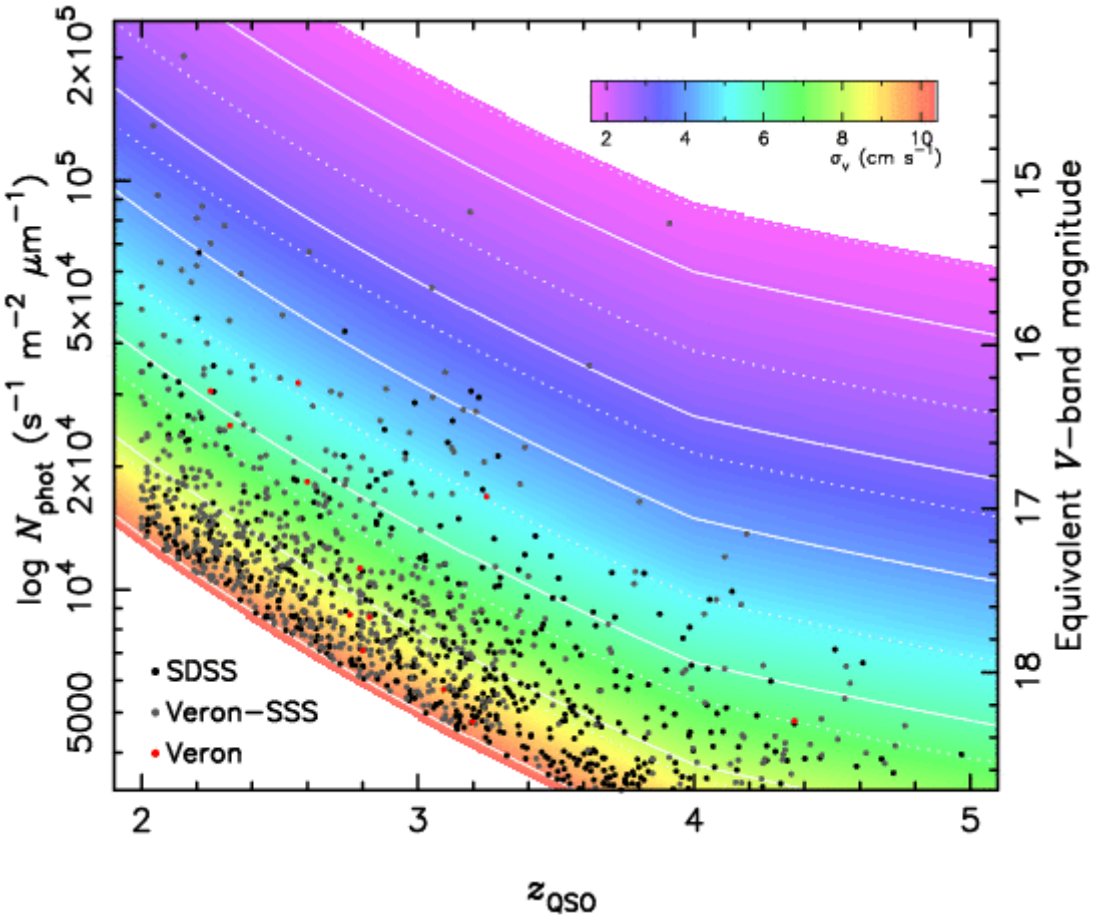
Bram Venemans

- New PI: Matt Lehnert.
- Revision of proposal and setting of specific goals of simulations in progress.
- Simulation tools nearly complete.
- Test simulations ran successfully, agree with ETC.
- Simulations will run during October.
- Analysis of results in November.
- Report in December.

C2: A dynamical measurement of the expansion history of the Universe

- V1 of report online.
- Added wavelength dependent throughput and wavelength cut-offs.





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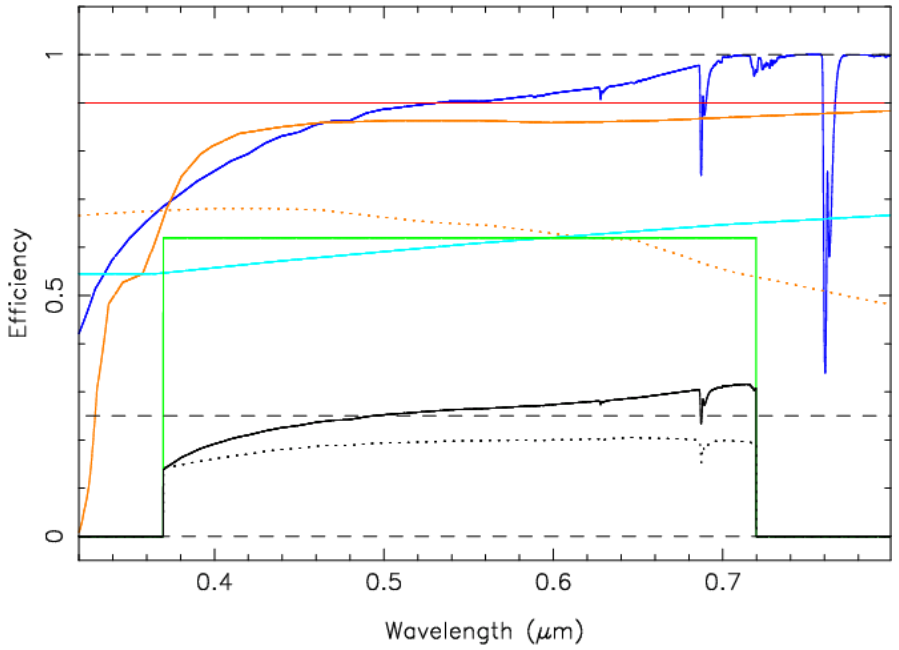
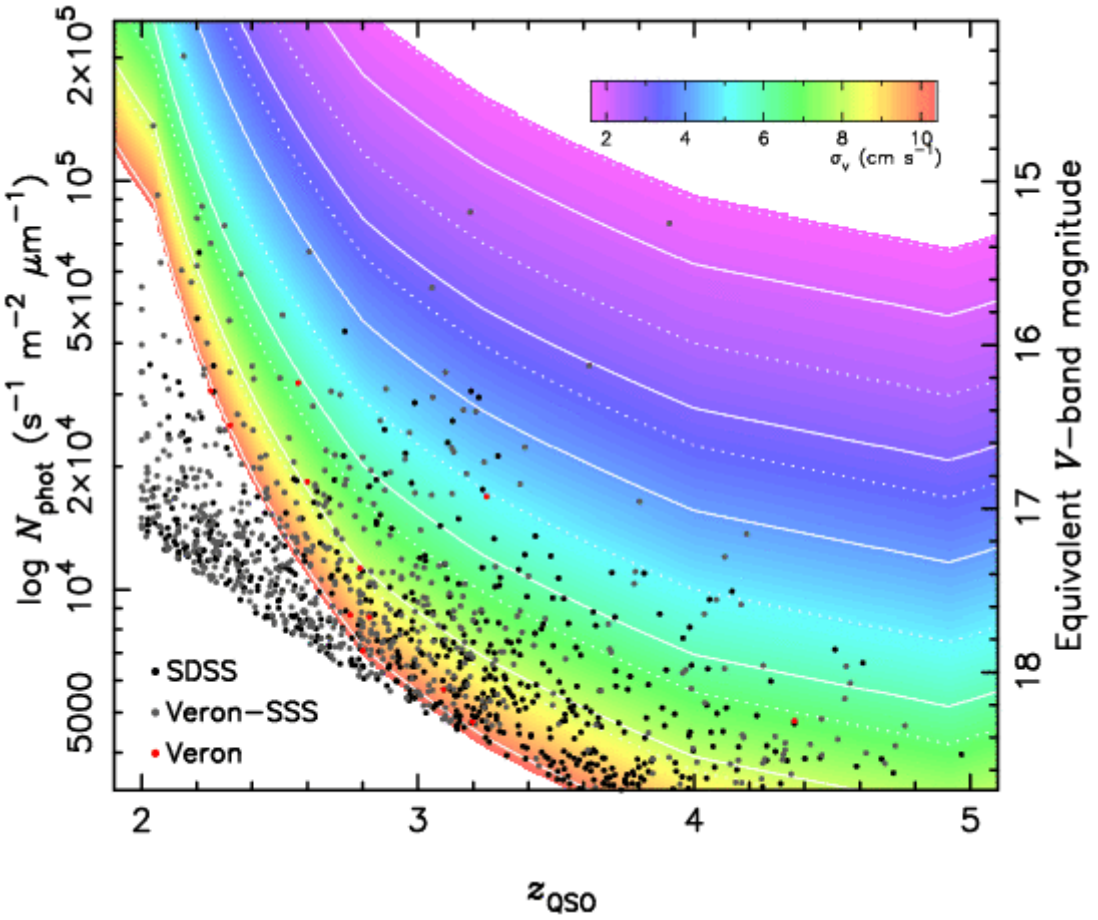
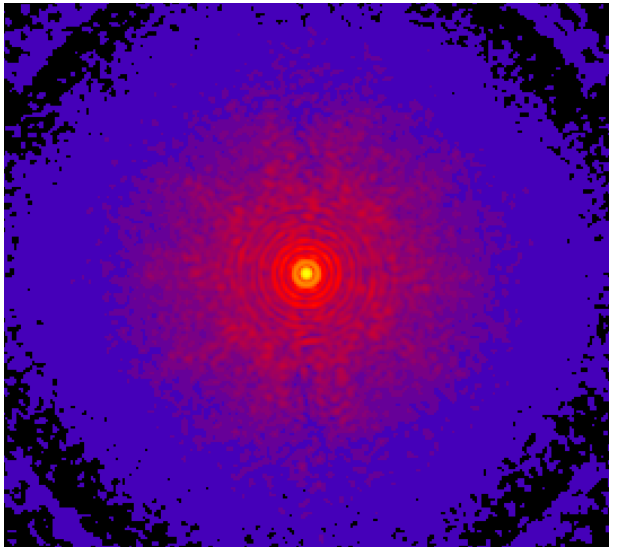
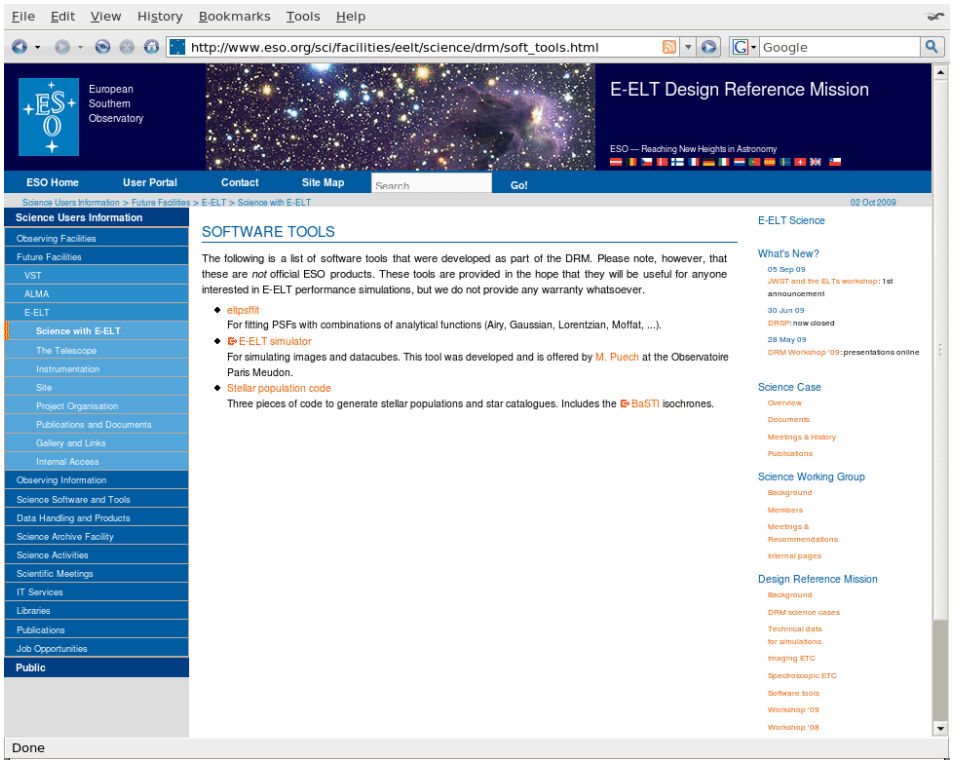




Other updates

- All simulated ESO PSFs in the database have been fit with `eltpsffit`. The fits are available in the database.





- New web page for software tools.