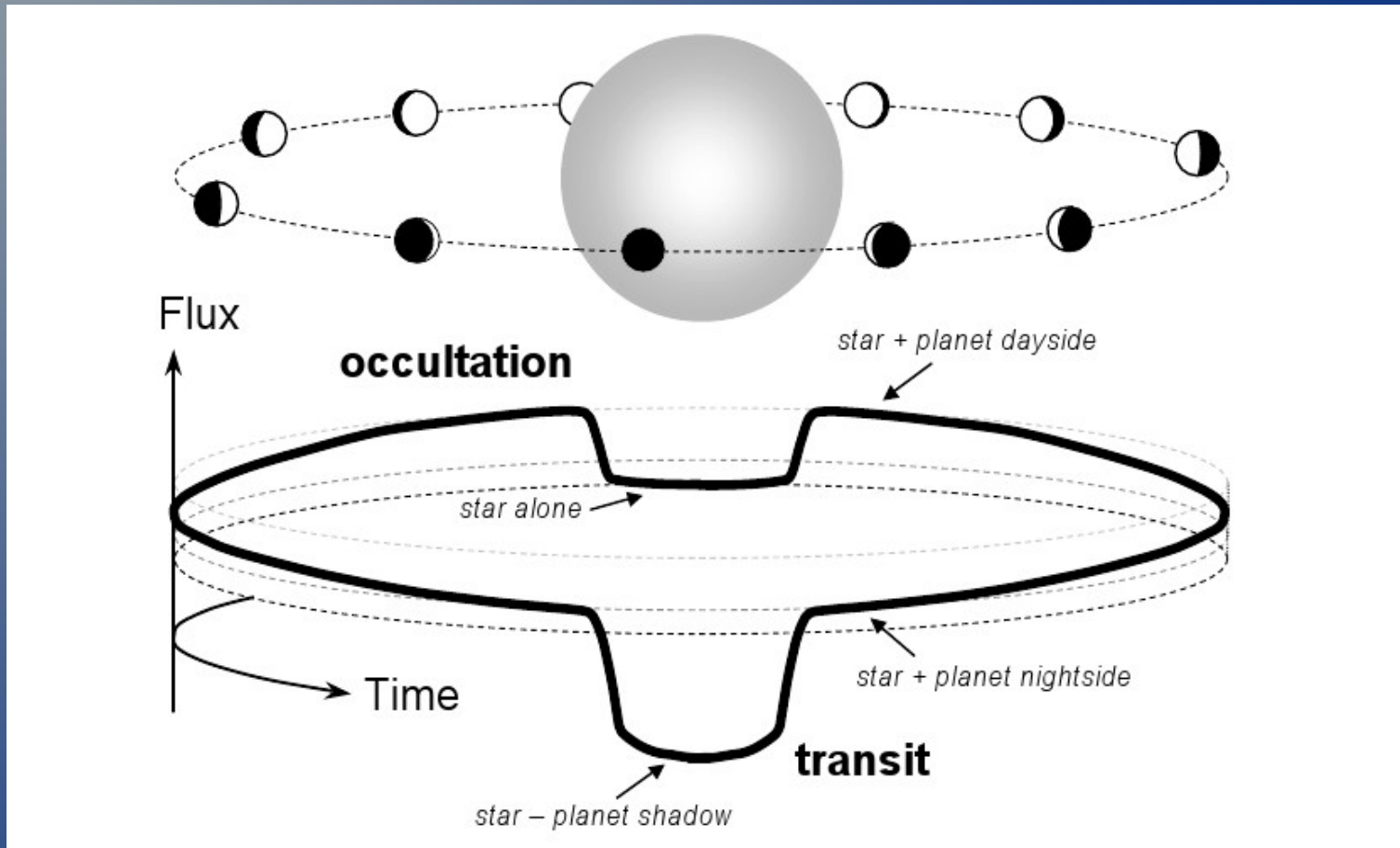


# WTS lightcurves (production and quality)



J. Winn: Transits and occultations, astroPh, 2010

Gábor Kovács

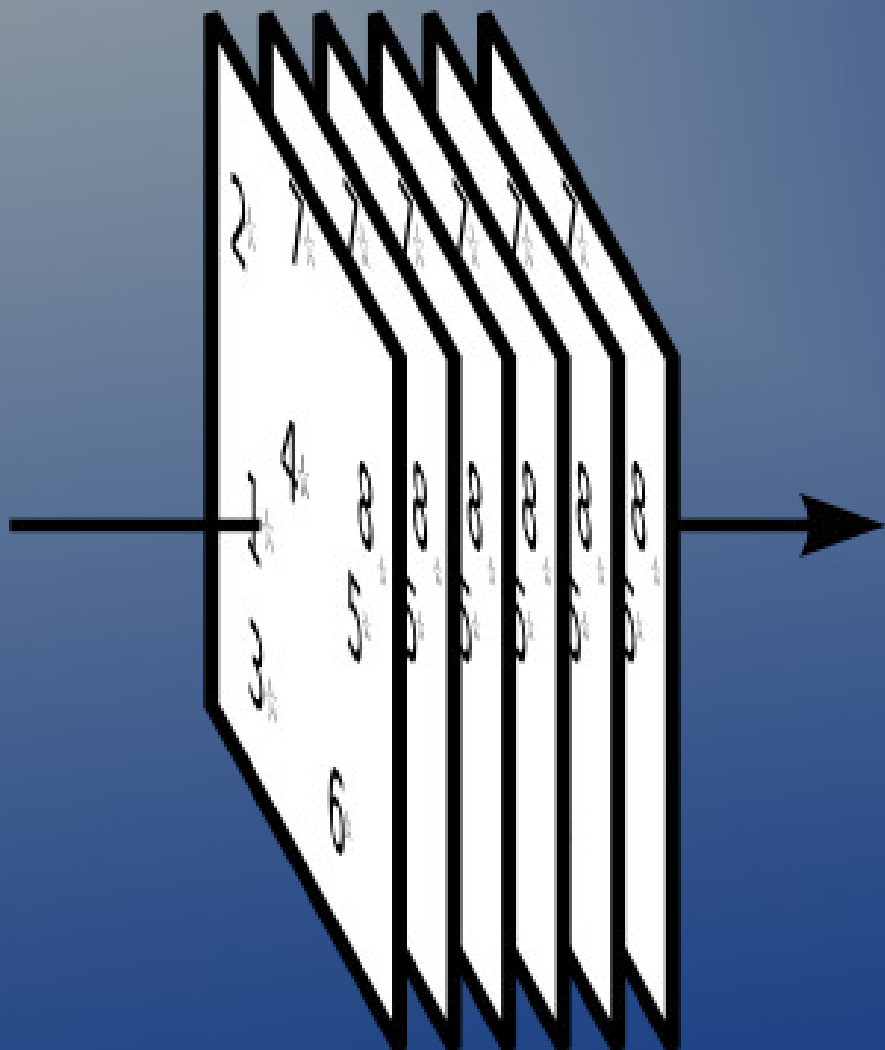
# Overview

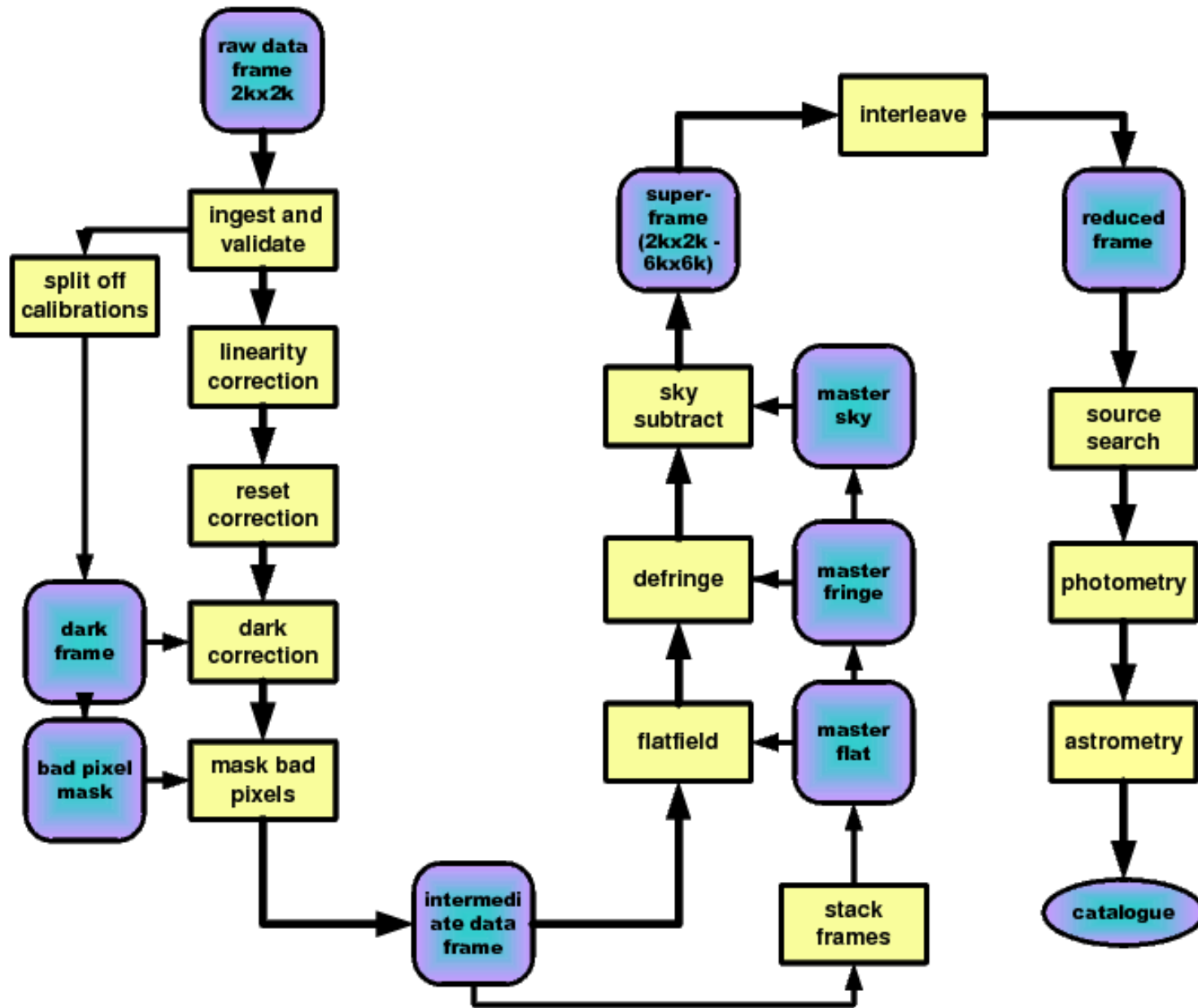
- Lightcurve production
- Diagnostic plots
- Sensitivity analysis
- Future work

# Lightcurve production

- Input:

- Reduced WFCAM images
- Master frame / catalogue





Simon Hodgkin: WFCAM pipeline design

RoPACS meeting, Munich

10 May 2010

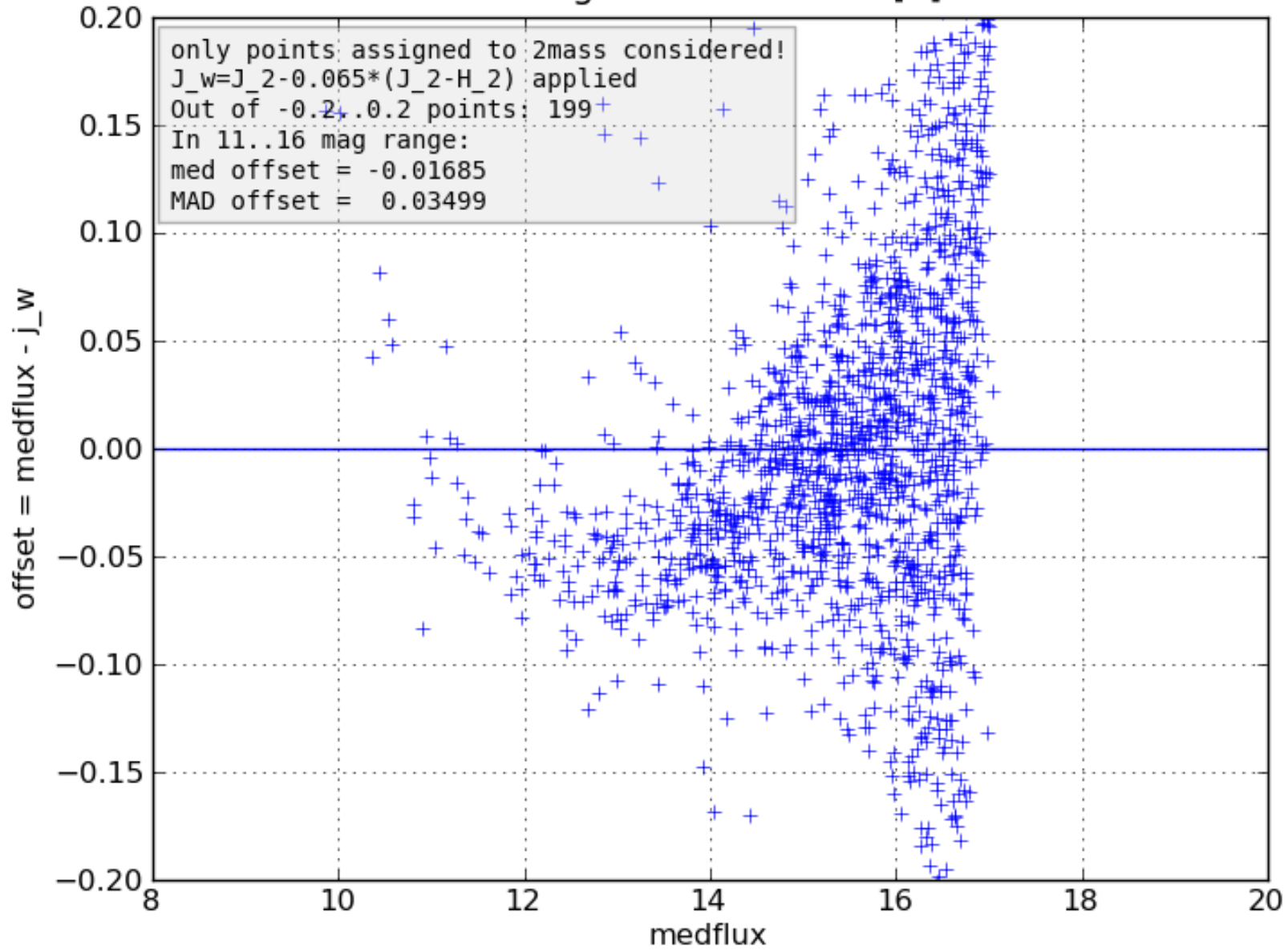
# Master frame

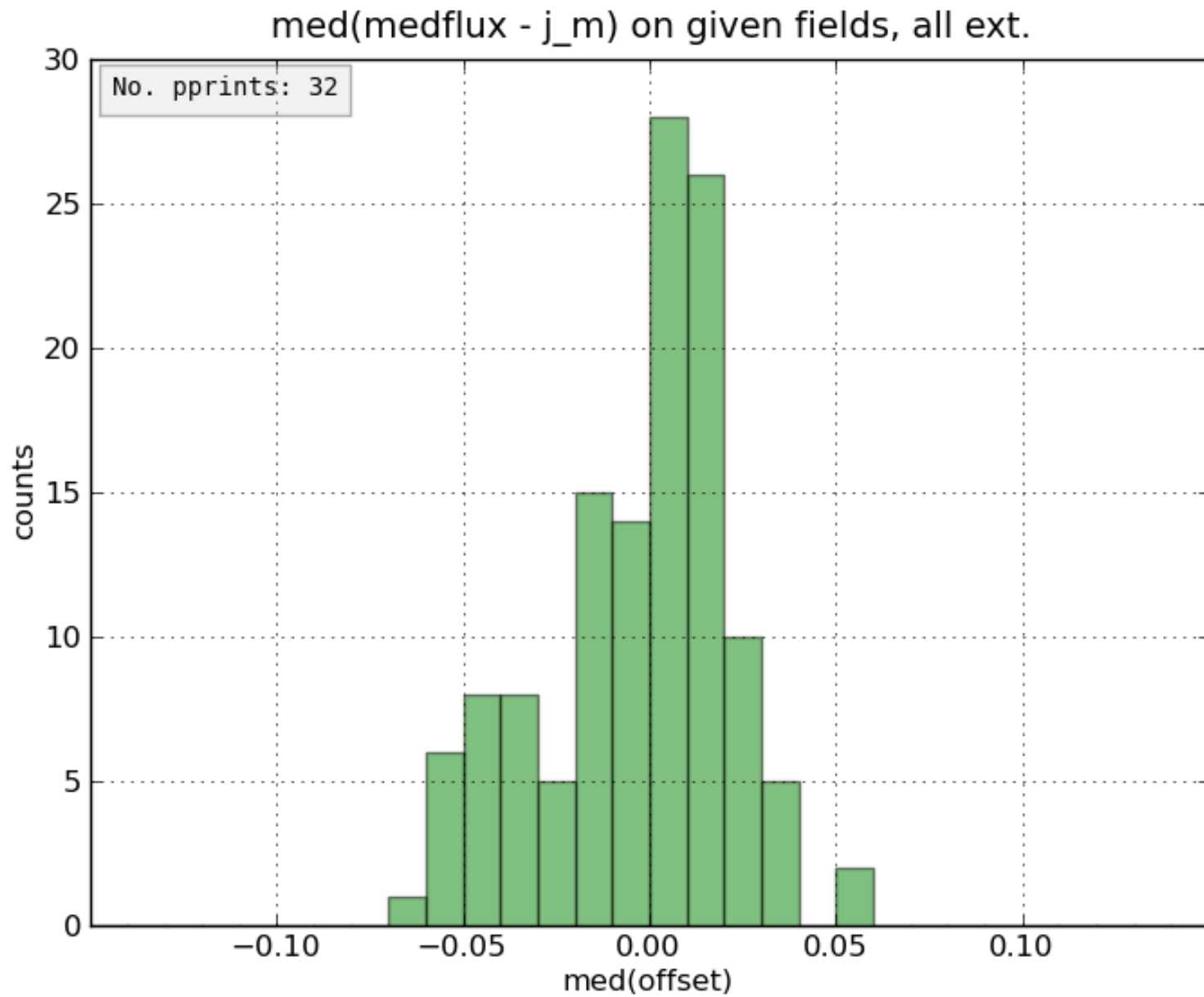
- Stacked from the best seeing frames
  - Hopefully fixed now
- S/N enhancement
  - Object catalogue (IDs)
  - Astrometry: objects are measured at master frame position
  - Photometry: 2MASS

# Lightcurve production

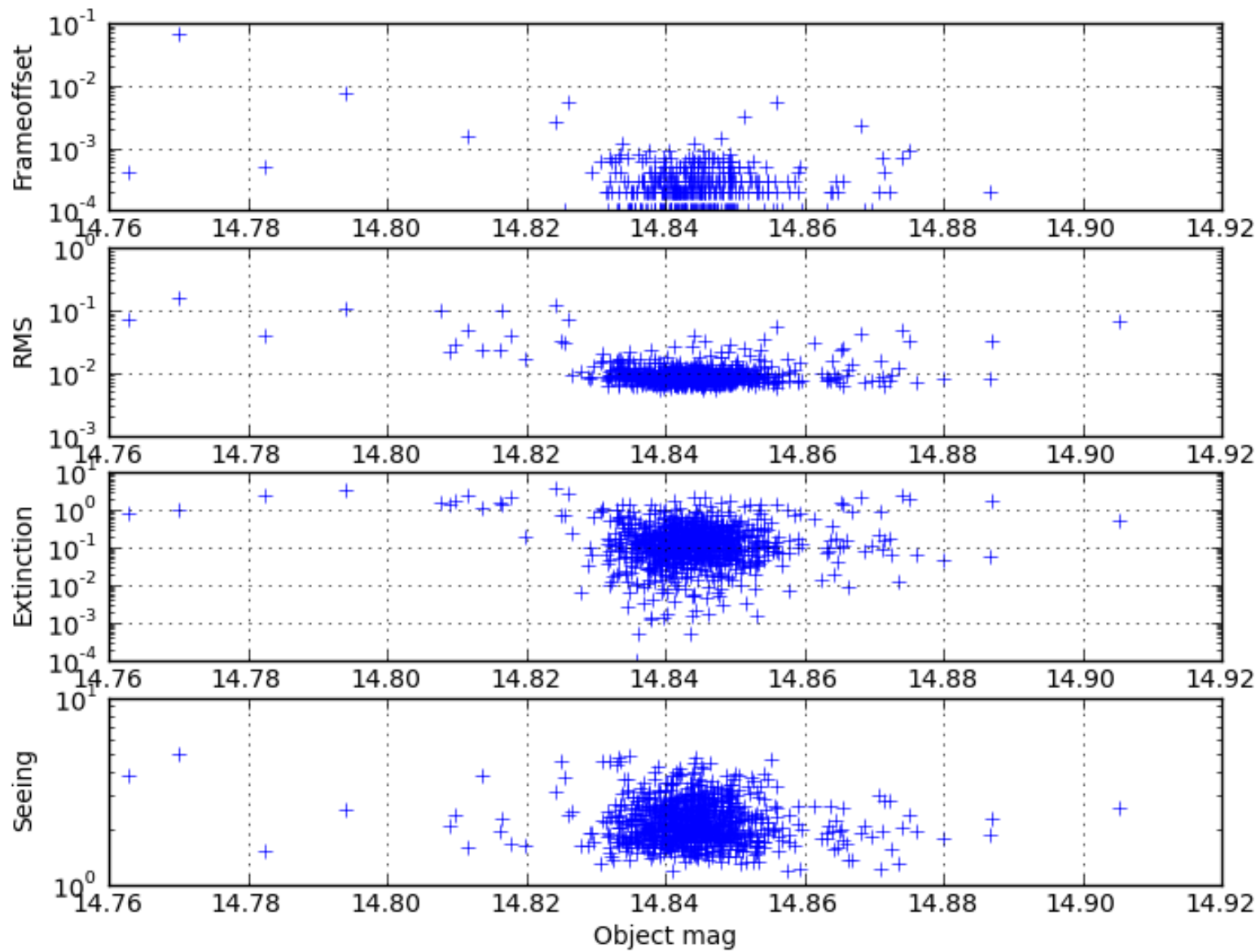
- Input:
  - Reduced WFCAM images
  - Master frame / catalogue
- Multiple aperture measurement
  - Smallest RMS is chosen for each object
  - Quadratic per frame normalization
- Systematics
  - Quadratic per object seeing correction

### seeing corrected lc 19b[1]





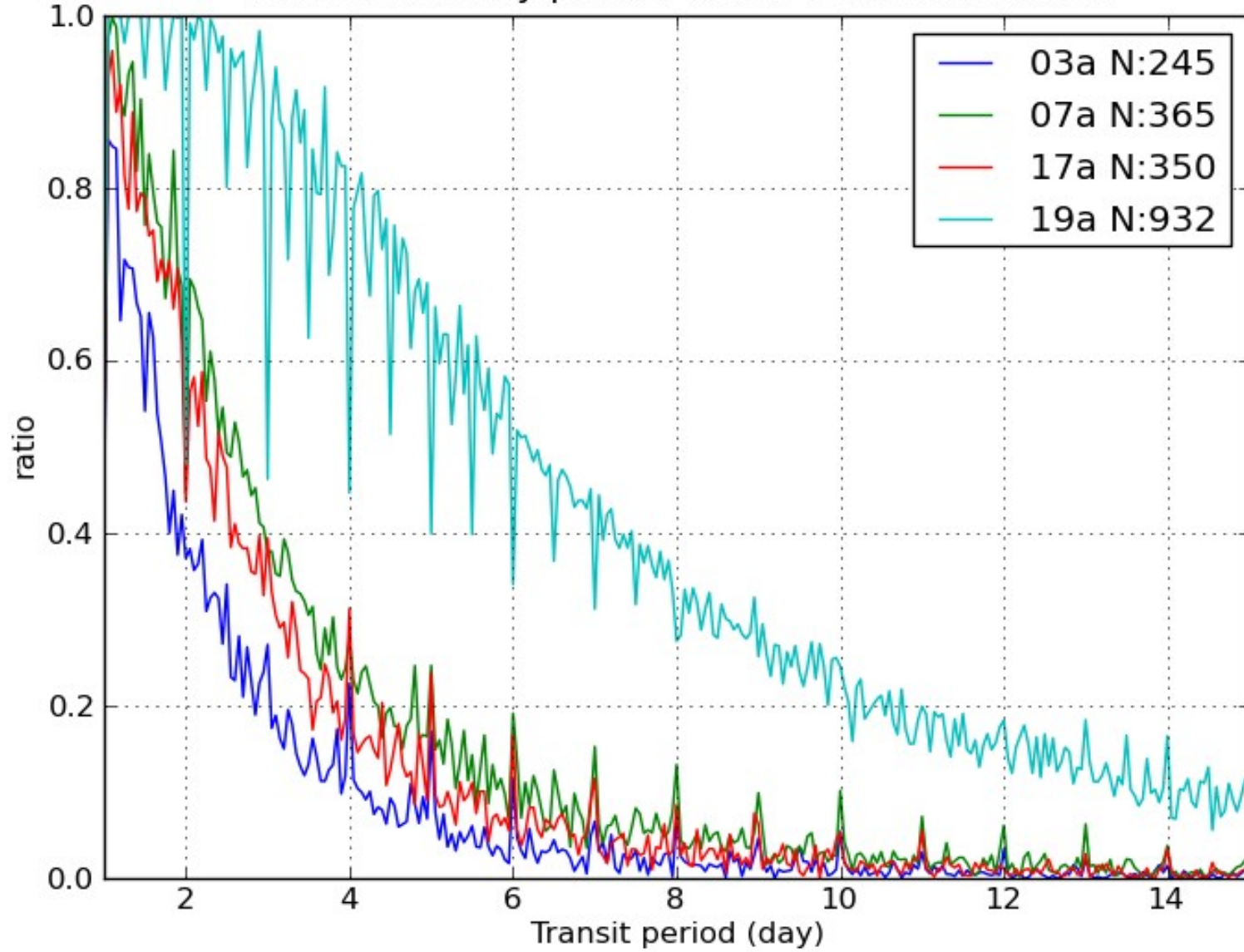




# Basic sensitivity analysis

- Depending on observation schedule, what is the ratio of detection of a transit in random phase
- Optimistic approach
  - At least one point in 3 different transit events
  - Box shape
  - Perfect detection (no noise, systematics...)
- Tells nothing about the detection probability of a certain system

Basic sensitivity plot for fields 03a,07a,17a,19a



# Future work

- Advanced simulations
  - Insert transit signals into real data
    - Includes all the noise, systematics, detection difficulties
  - Include host-planet system parameters
    - Detection or non-detection contributes to systems statistics
- Follow up observations

Thank you !

Field of view: 1.6 sq deg per field  
Exposure: 10s  
Cadence: 16min

M dwarfs J=16: 6000

[exoplanets.org](http://exoplanets.org)  
[exoplanet.eu](http://exoplanet.eu)

All: 452 planets,  
Transiting: 79 planetary systems