

# Photometric calibration plan

## **The KIDS Photometric Quick Pass**

### **Goal: Establish Photometric ZeroPoints**

- Follow the tiling strategy of the main KIDS survey.
- Photometric Conditions
- No seeing or Moon Constraint
- ugri bands: 1 minute single exposures in each band. (z-band from VIKING)
- Regularly interspersed with Standard Star Field Observations
- KIDS-N: Compare with SDSS (KIDS-S, S.SkyMapper?)
- KIDS-wide i: Calibrate entirely from SDSS
- KIDS-S: Possible synergy of Quick Pass with ATLAS survey: requires  $< 1.4''$  seeing and overlapping tiles (would provide extra depth, fill gaps, cosmic ray rejection)

# Astrometric Accuracy

- Required Accuracy:
  - KIDS Management Plan: not set. But need as good as possible relative astrometry! (lensing).
  - In particular, require consistency for all regridded frames being coadded (see e.g. Heraudeau results).
- Absolute astrometry:
  - old:
    - AstroWISE: Set by reference catalogue (0.3" for USNO). Typical total errors ~0.5"
    - Global Astrometry: 0.34" FWHM regrid-coadded frame (Heraudeau, Nov 07). Bug in S/W
  - Improved Astrometry (report):
    - Local: 0.3" (USNO) / Global <0.05", all <0.1"
    - Repeatability: Local 0.085" RMS / Global 0.074" RMS (associating catalogues of regridded & coadded frames)
- Relative astrometry:
  - AstroWISE: replacing USNO catalogue by a SourceList (Koppenhoefer): 0.03-0.04" (c.f. reference image). Likely to improve with improved astrometry (inclusion of relative global astrometry?)
  - Astrometrix (Heraudeau - DEEP 3a): <0.02" (0.005" for 16 pointings in 1 night)
- Additions?: Incorporate SCAMP into AstroWISE (Radovich)?

# Photometric Accuracy

- Requirements:
  - KIDS Management Plan: 0.01 mag after tweaking; 0.05 mag raw ZPs
  - Heraudeau / Lensing Meeting: 0.01-0.02 for good photo-z's
- Absolute photometry:
  - AstroWISE:
    - Koppenhoefer: ~0.1 mag
    - Heraudeau: 0.013 mag dispersion of ZP within a night for DEEP3 frames. (c.f. 0.08 mag for Theli reduction). Trend of ZP with time within night?
- Relative photometry:
  - AstroWISE: Facility to do this? SCAMP?
  - Koppenhoefer: few mmag using differential photometry

# Other Photometric requirements

- Double Image Mode: Now available within AstroWISE
- Matched PSF Photometry:
  - Convolution: Koppenhoefer has introduced into AstroWISE - testing stage
  - PSFEx: Bertin
  - GAAP: Incorporation into AstroWISE
- Galactic Extinction Maps: Verdoes?
- Calibrating using Stellar tracks (colour accuracy)
- Photometric Redshift Code:
  - Existing Munich code: Snigula
  - Looking for person to work on improved methods

# Calibrating the survey

- Test Case Data:
  - CFHT+UKIDSS field: Seitz/Lerchster
    - Ingestion of reduced CFHT and UKIDSS data
- Spectroscopic Data:
  - Ingestion of spectroscopic redshifts?

# Other Issues

- Shapelets / shear measurements
- Masking of bright stars / haloes / cosmic rays / asteroids / satellites / defects etc (cold/hot pixel map, weights, etc)
- Coverage Maps and Scheduling (ESO S/W to prepare OBs automatically)....
- Deletion of Files / Objects
- PanoraPix (Googlesky?)
- Quality Control
- Software Stability