# KiDS Survey Status

Jelte de Jong, Leiden Observatory
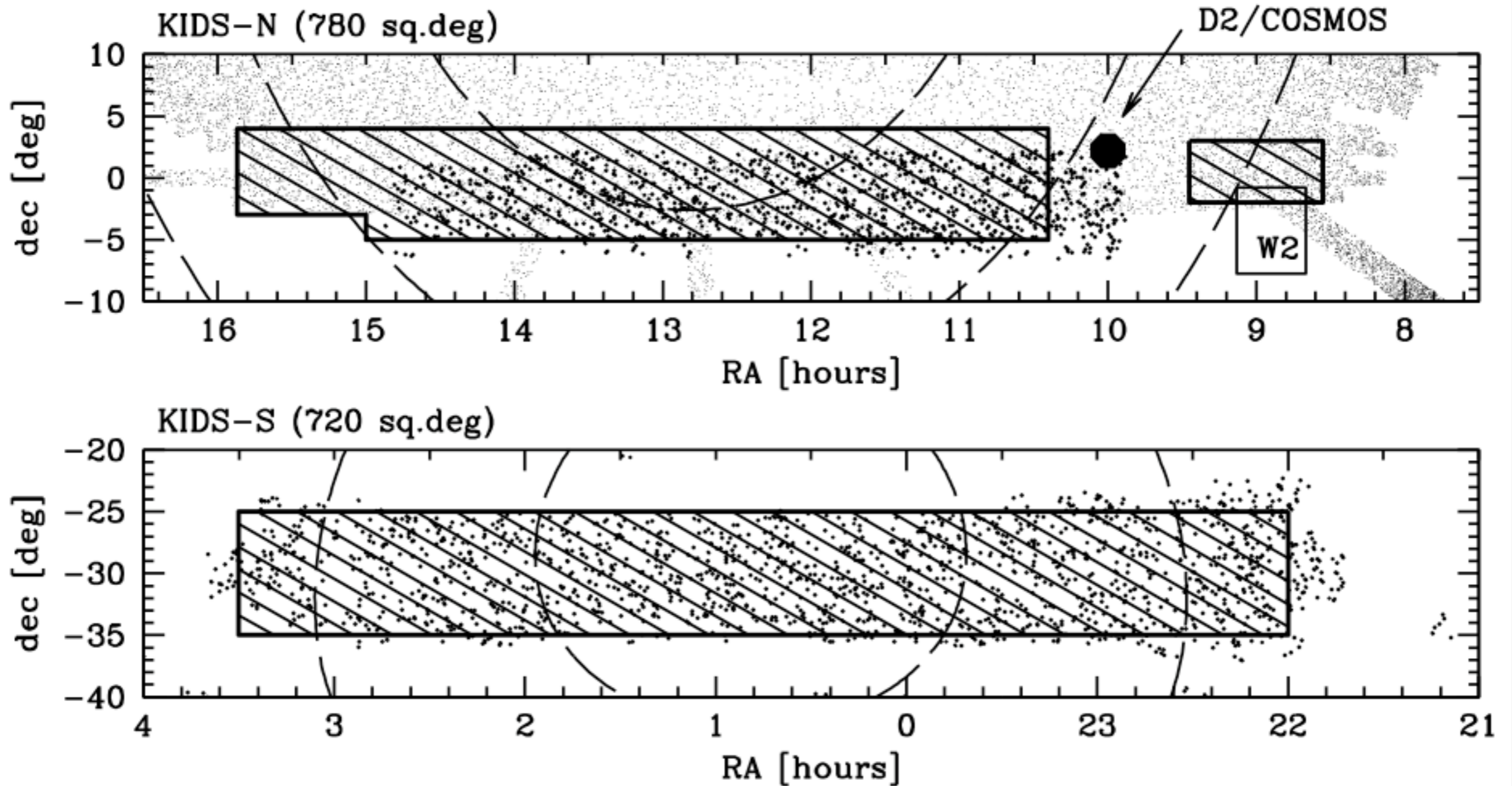
# KiDS Survey Status

- Survey overview

- Observational planning

- Data in hand

- Data processing

- VST calibration plan

# Survey overview

- deep survey: 1500 sq.deg. in u, g, r, i

- two fields: KiDS-S (-35°<δ<-25°) and KiDS-N (-5°<δ<+5°)

- overlapping with VIKING

- ~~shallow photometric pass for phot. cal.~~

- repeat pass in g, providing 2-year baseline

# Survey overview

# Survey overview

Fields chosen such that:

- observations can be done year-round

- 2dF and SDSS (KiDS-N) spectroscopy available for several 100,000 galaxies

# Survey overview

Observing conditions and exposure times such that:

- balanced over astro-climate conditions

- median galaxy redshift ~0.8

- best seeing for r-band, the weak lensing band

| Filter | Exp. time | Median seeing | Moon | 10σ AB limit |
|--------|-----------|---------------|------|--------------|
| u | 1000 s | 1.0" | Dark | 24.8 |
| g | 900 s | 0.8" | Dark | 25.4 |
| r | 1800 s | 0.6" | Dark | 25.2 |
| i | 1200 s | 0.7" (broad) | Bright | 24.2 |

# Survey overview

- Survey 'tiles' follow the Astro-WISE platesystem

- 1 OB per filter; per tile 1 group container

- OBs set-up as follows:

| Filter | Exp. time | Dither | Seeing | Airmass | Moon |
|--------|-----------|--------|--------|---------|------|
| u | 4x250 s | diag | <1.1" | <1.2 | FLI<0.4; dist>90° |
| g | 5x180 s | diag | <0.9" | <1.6 | FLI<0.4; dist>90° |
| r | 5x360 s | diag | <0.7" | <1.2 | FLI<0.4; dist>90° |
| i | 5x240 s | diag | <1.1" | <2.0 | any FLI ; dist>60° |

# Observational planning

Goal 1: provide full 9-band photometry a.s.a.p.:

- Highest priority to areas already covered by VIKING

- Grouping of OB's per tile: first observe tiles that have been partially observed already

Goal 2: complete survey (excl. repeat) in 3 years:

- Aim for 250 sq.degrees per semester

- Ask time for 400 sq.degrees per semester

# Observational planning



KIDS−N (780 sq.deg)

D2/COSMOS

60 tiles

65 tiles

W2

KIDS−S (720 sq.deg)

81 tiles

60 tiles
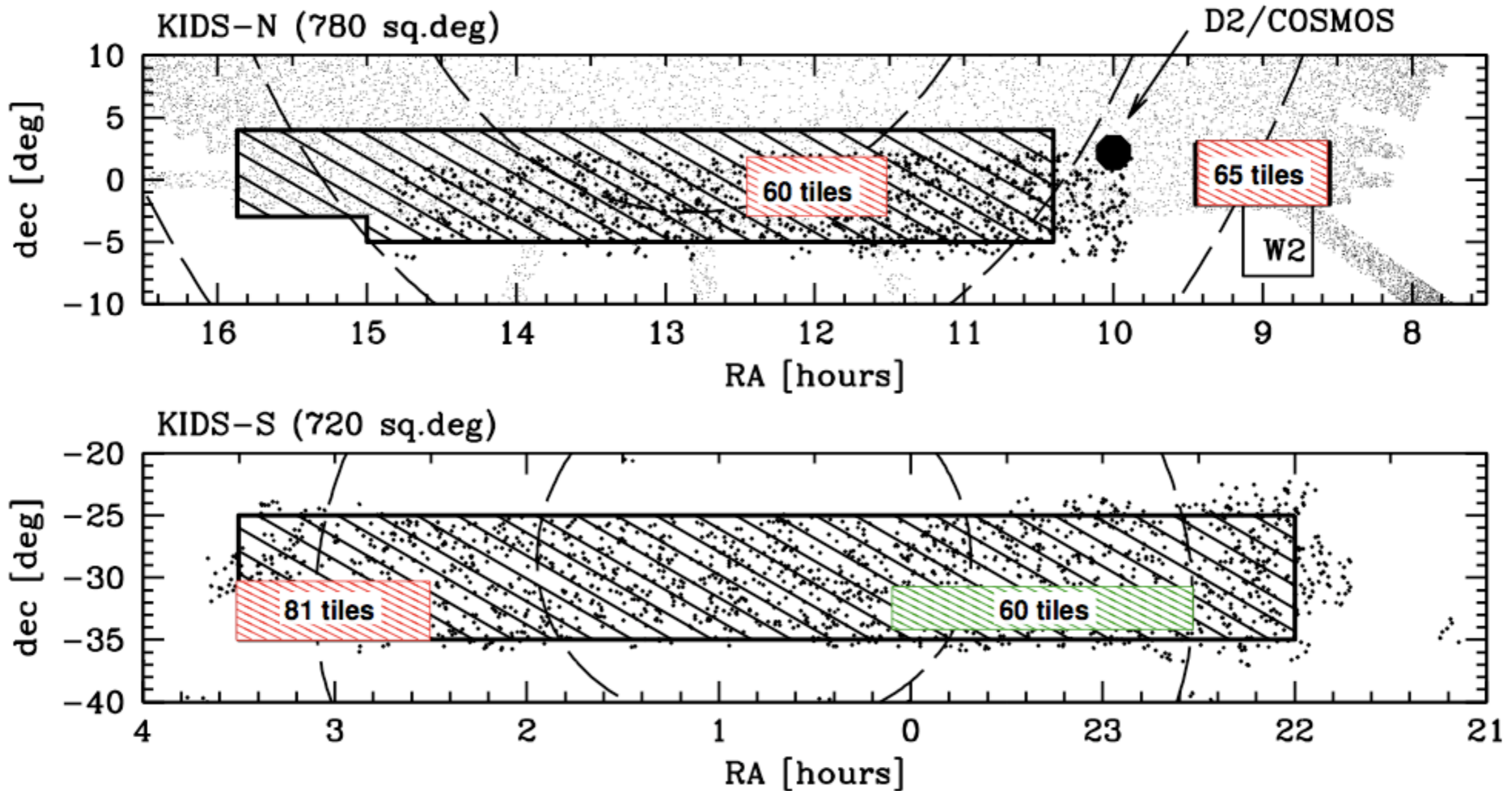
**KiDS observing plan for P88**

Time awarded: 420 hours
Tiles submitted: 210 (exec. time 419.7 hr)
Not completed EST OBs are also carried over to P88

Targeted areas coincide with existing
VIKING data. Distribution over RA
guarantees observable tiles during complete
semester.

# Data in hand

Early Science Time (Sept - 15 Oct):

- 240 OBs (60 tiles) submitted

- 45 OBs "completed" and ingested into Astro-WISE: 8 u, 8 g, 29 i, 0(!) r

- 23 OK; 16 NOK (11 due to dead CCD); 6 TBD

Also handful of OBs pre-EST and 73 OBs P88

# Data processing

KiDS data processed with Astro-WISE

Astro-WISE:
- was designed for VST data
- data-centric survey handling system, based on a fixed data model, in which all data objects are instantiations of a data class
- uses a federated database, allowing people at different locations to work together on data processing and quality control
- stores data lineage of all objects

# Data processing

**Target Processor**

**Contact**
Willem-Jan Vriend

**DB User**
awjdejong

**Help**
Getting Started

**Project**

| KIDS | ▲▼ |

**Instrument**

| OMEGACAM | ▲▼ |

**State**

1. Preselect Target
2. Specify Target
3. Select Target(s)
**4. Process or Query**

**Options**

Preferences
Process Parameters *
Upload Code
Job overview

## Jobs for awjdejong

| DPU | ID | Actions | User | Status | Submitted | Details |
|---|---|---|---|---|---|---|
| dpu.hpc.rug.astro-wise.org | 9130 | view  stop | awjdejong | SENDDATA | Fri Dec 2 14:58:09 2011 | Q/R/F/E/A/S/U 98/0/0/0/0/0/0 |

| Refresh |   | Cancel |

Browse previous processing logs of awjdejong

page generated 2011-12-02 14:58:14.129548
generation time 0:00:08.777072
For optimal experience use firefox browser

empowered by

ASTRO
WISE

| 1 | ☐ | 2011-08-26 06:22:50 | Sci-EHELMICH-OMEGACAM-------OCAM_u_SDSS---Coadd---Sci-55862.5417669-deff3fbeb3efb |

# Quality of RawScienceFrame:
## OMEGACAM.2011-09-06T08:19:11.265_30.fits

see 2 previous comments

DBname: awjdejong project: KIDS

is_valid = | 1: valid ⬍ | | Enter comment he | Submit

## Processing Details

| creation_date | 2011-09-06 15:46:13 |
|---|---|
| is_valid | 1 |
| quality_flags | 0 |
| Privileges | 3 |

## Image Statistics Details

| mean | +8.970e+02 |
|---|---|
| median | +8.670e+02 |
| stdev | +1.276e+03 |
| min | +2.580e+02 |
| max | +6.554e+04 |

## Photometry Details

| creation_date | 2011-10-27 11:29:26 |
|---|---|
| is_valid | 1 |
| quality_flags | 0 |
| zeropoint | 24.147 |
| zp_error | 0.106 |
| zp_origin | derived |
| num_sources | 31 |
| extinction | 0.046 |
| ext_error | 0.003 |

### Observational Details

| DATE_OBS | 2011-09-06 08:19:11 | OBSERVER | UNKNOWN |
|---|---|---|---|
| MJD_OBS | 55810.3466582 | EXPTIME | 240.0 |
| OBJECT | KIDS_338.6_-33.1 | AIRMSTRT | 1.662 |
| R.A. | 22:34:25.3322 | AIRMEND | 1.696 |
| Dec. | -33:09:39.6360 | Filter | OCAM_i_SDSS |
| | | mag_id | SloanI |

### Chip ESO_CCD_#94 of Instrument OMEGACAM
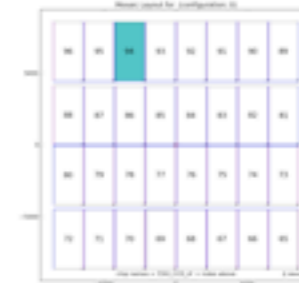


### RawScienceFrame
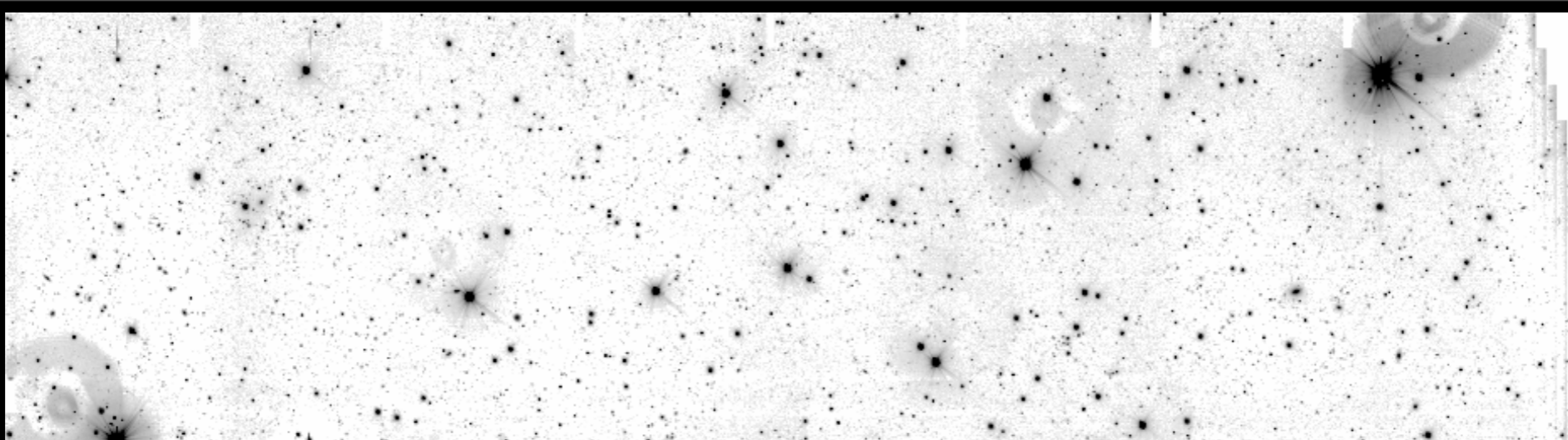2144 X 4200 pixel
7.63 X 14.94 arcmin
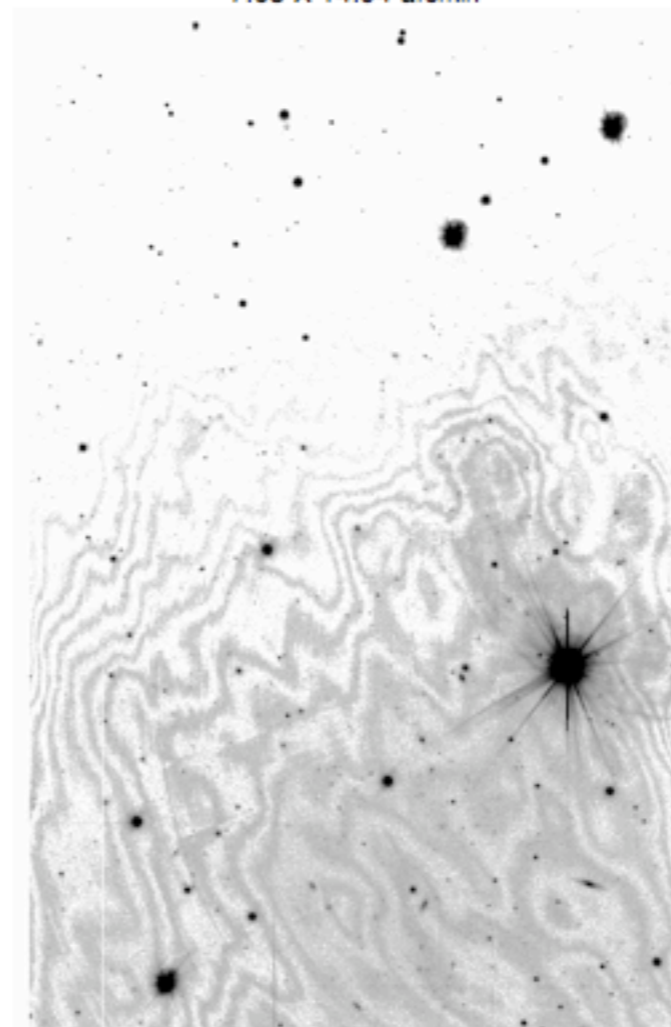
# Data processing

- Per chip calibration

- Master flat = dome (small scale) + twilight (large scale)

- Illumination correction tied to a master flat
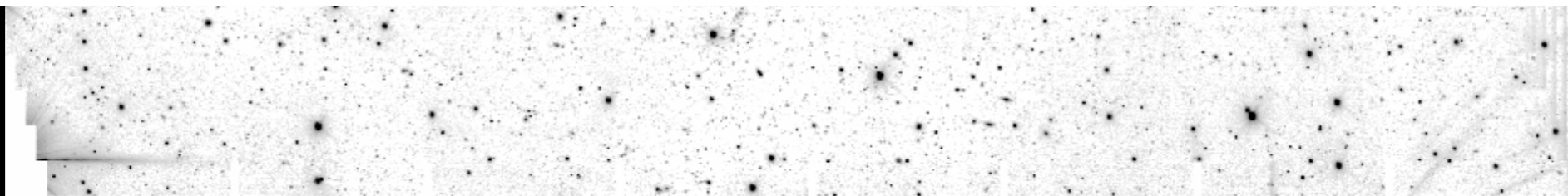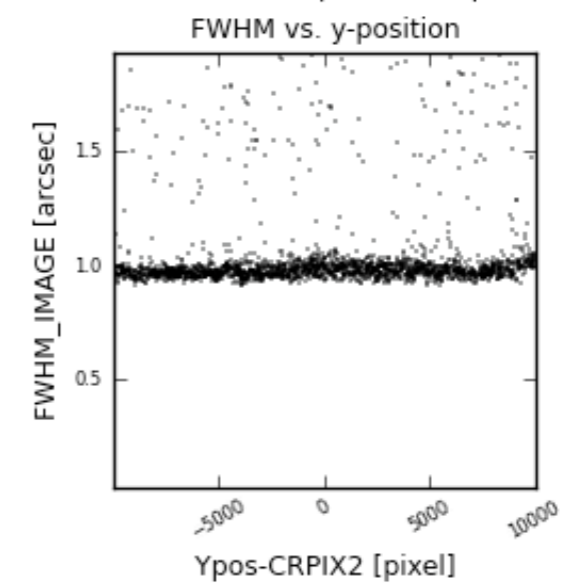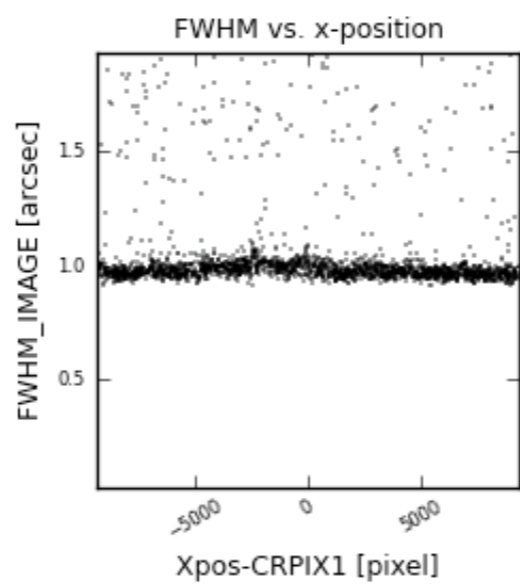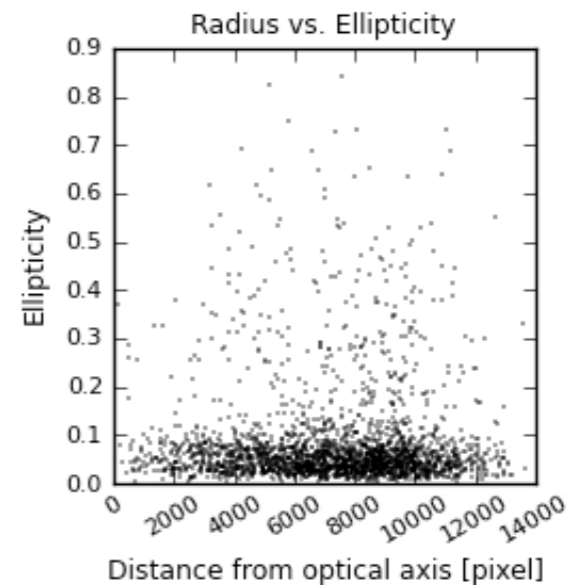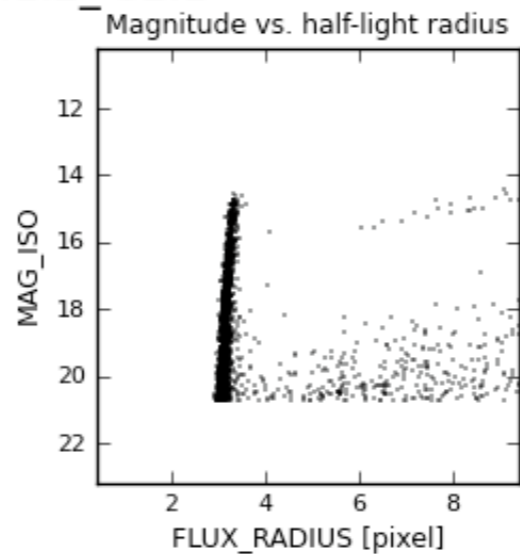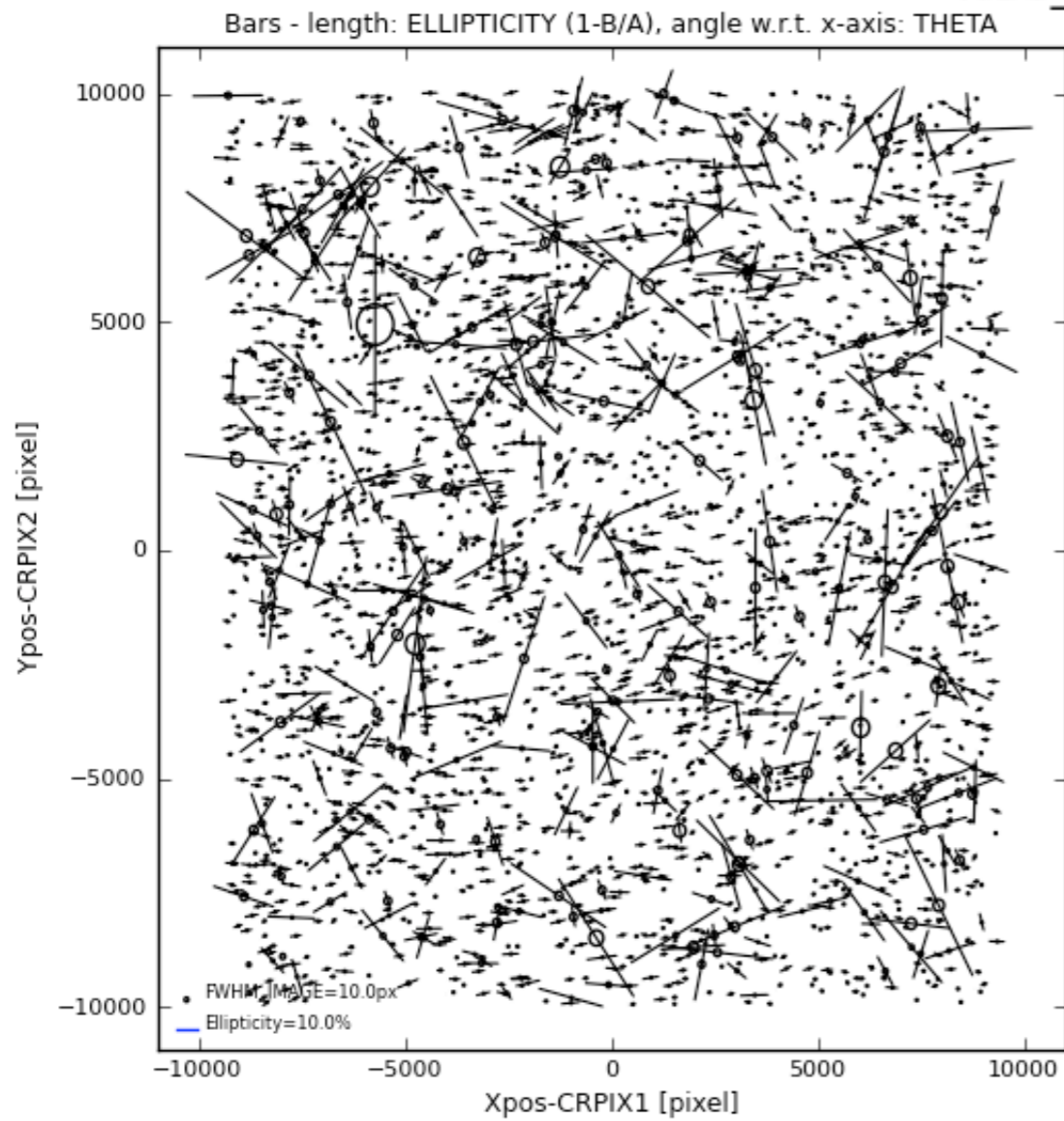
- Background subtraction upon coadding
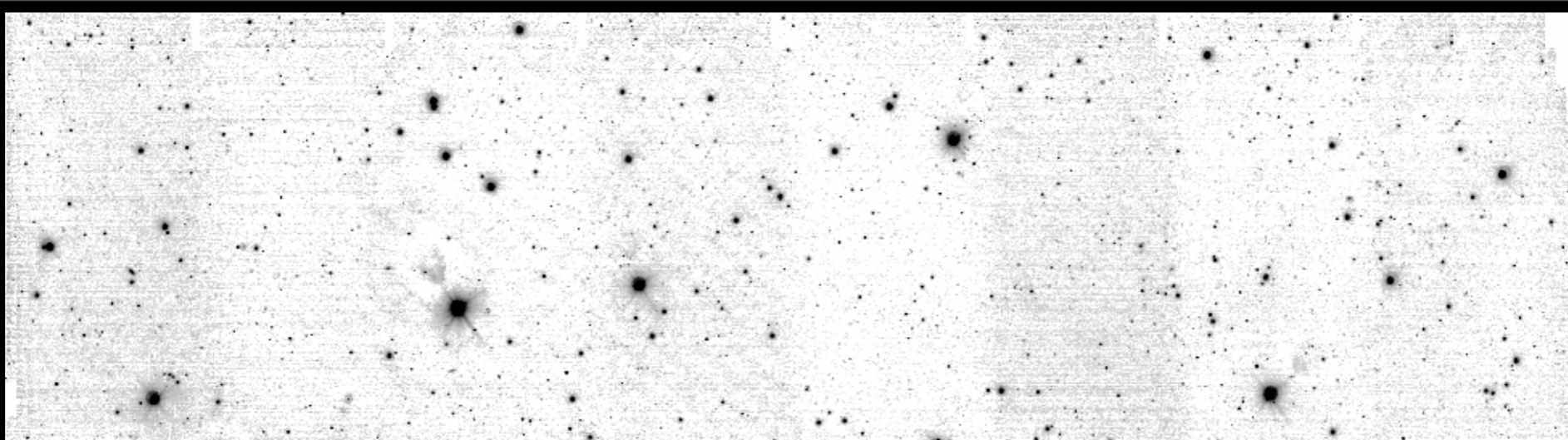
PSF Anisotropy for 1 frame(s) with DATE-OBS ??, filter OCAM_u_SDSS
KIDS_338.6_-33.1

g
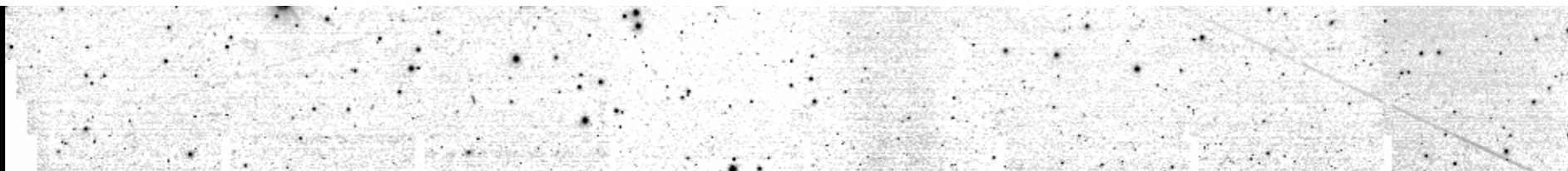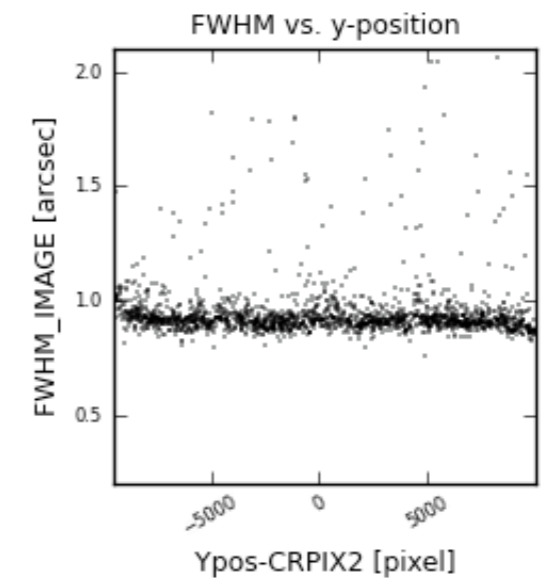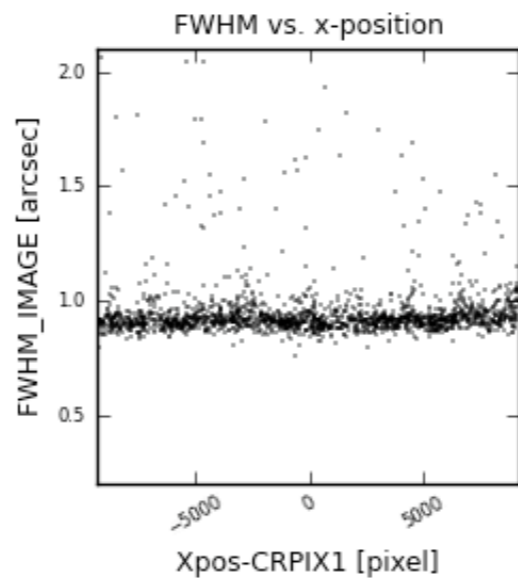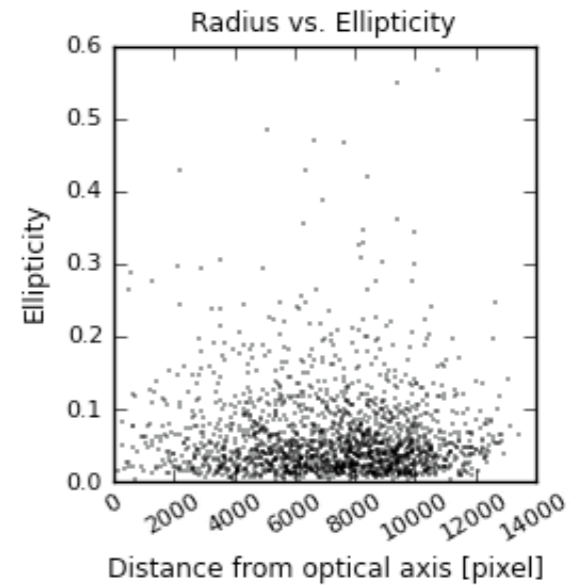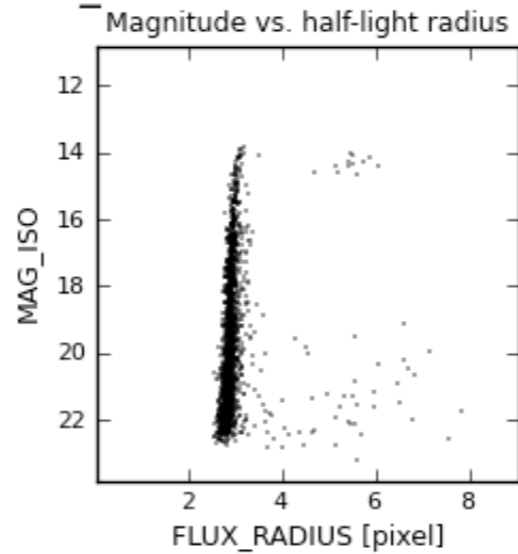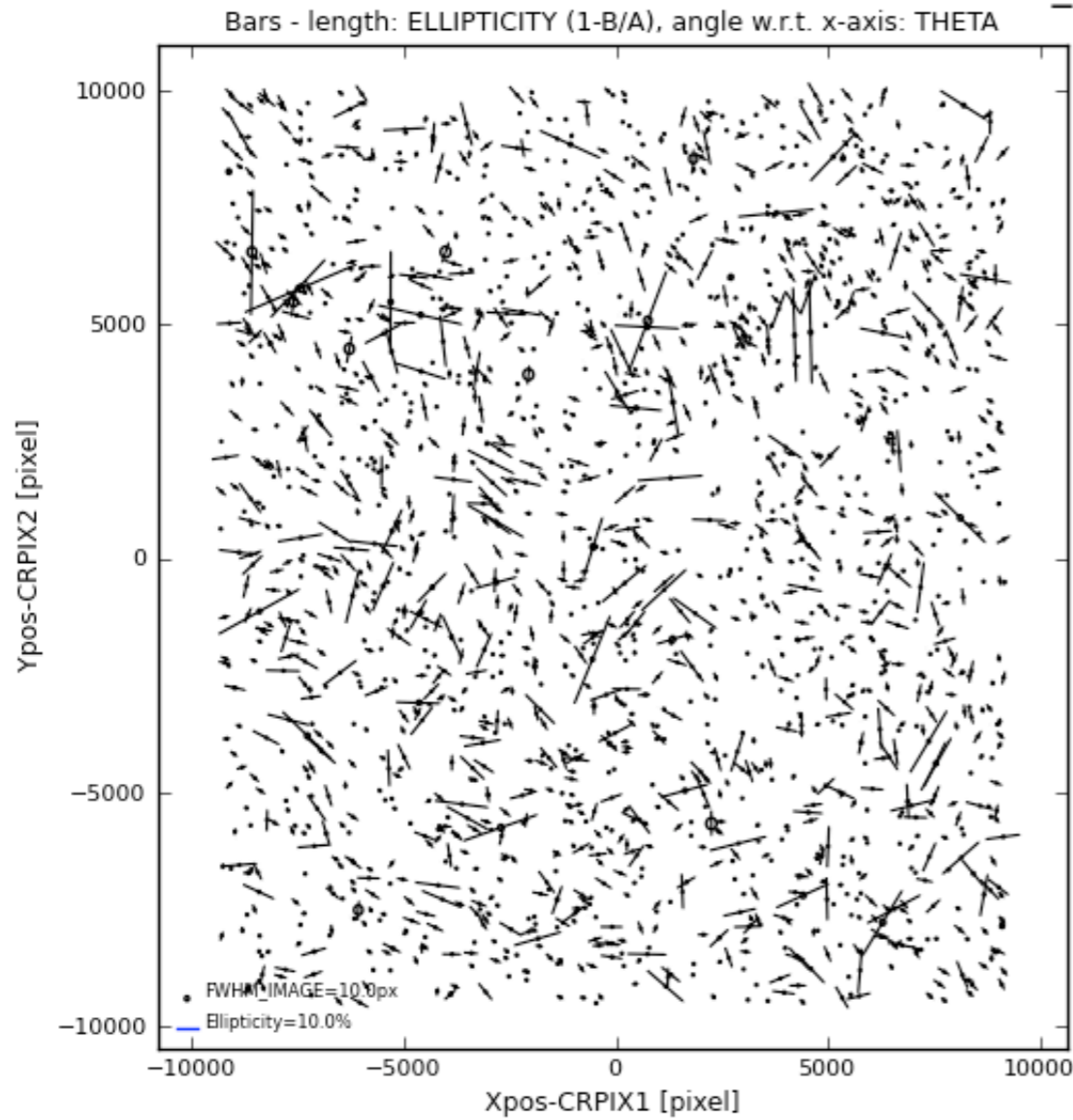
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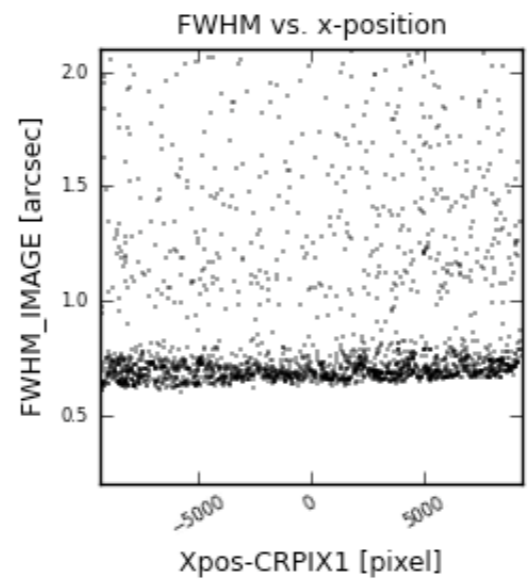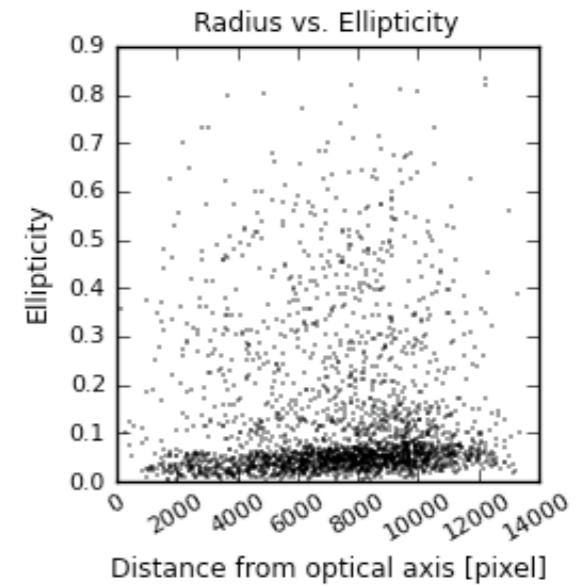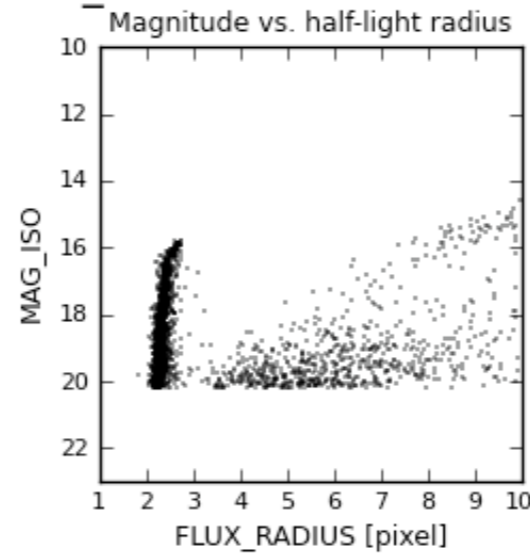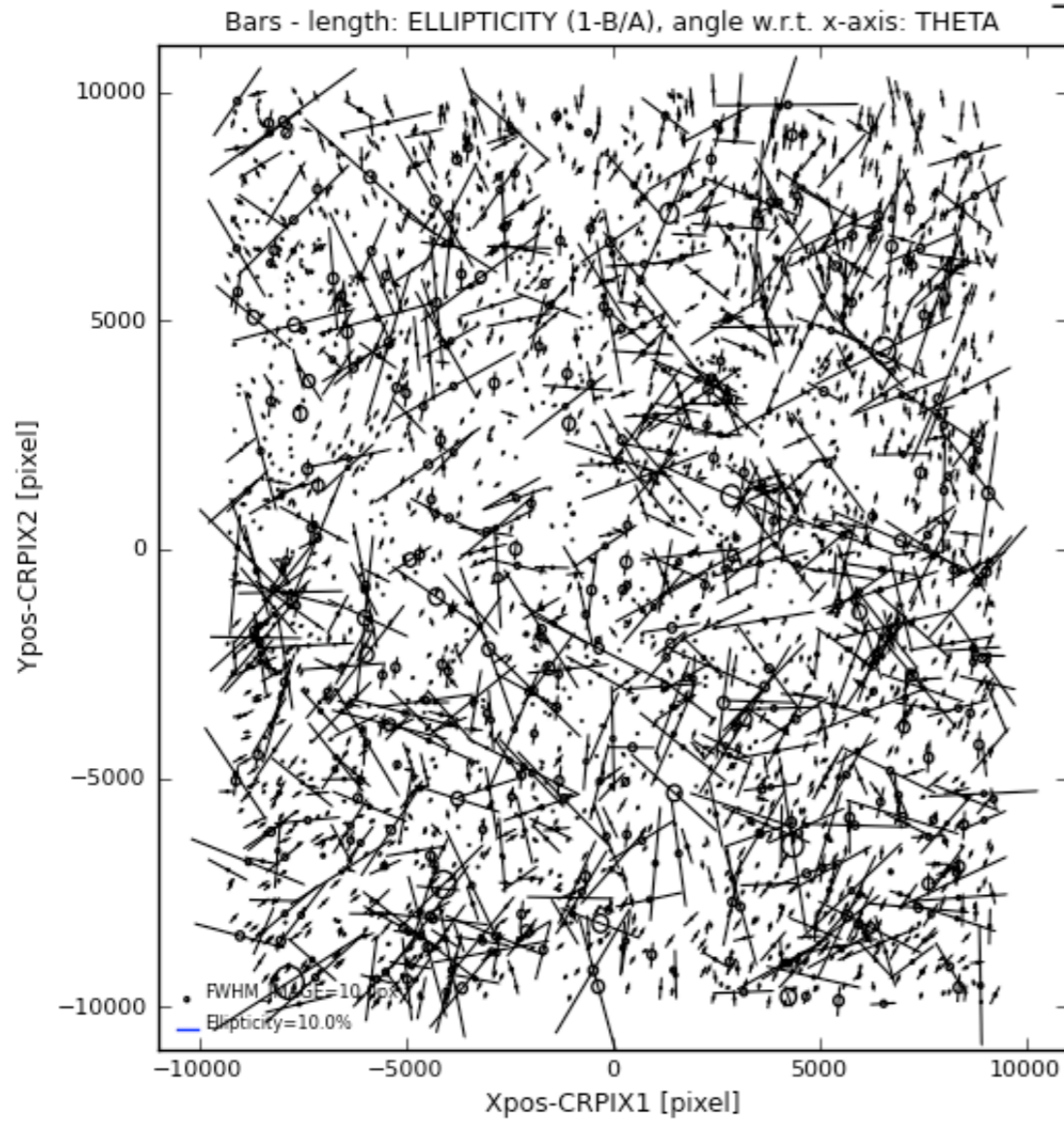KIDS_341.2_-32.1

r
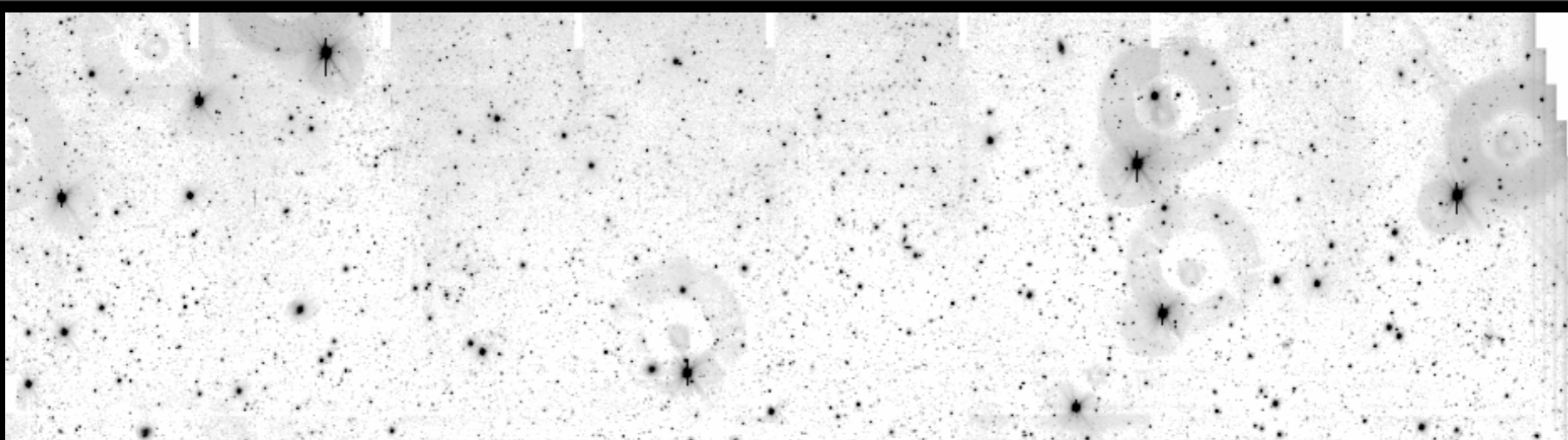
PSF Anisotropy for 1 frame(s) with DATE-OBS ??, filter OCAM_r_SDSS
KIDS_355.3_-31.2

Bars - length: ELLIPTICITY (1-B/A), angle w.r.t. x-axis: THETA

Magnitude vs. half-light radius

Radius vs. Ellipticity

FWHM vs. x-position

FWHM vs. y-position

FWHM_IMAGE=10.0%
Ellipticity=10.0%

Xpos-CRPIX1 [pixel]

Ypos-CRPIX2 [pixel]

MAG_ISO

FLUX_RADIUS [pixel]

Ellipticity

Distance from optical axis [pixel]

FWHM_IMAGE [arcsec]

Xpos-CRPIX1 [pixel]

FWHM_IMAGE [arcsec]

Ypos-CRPIX2 [pixel]
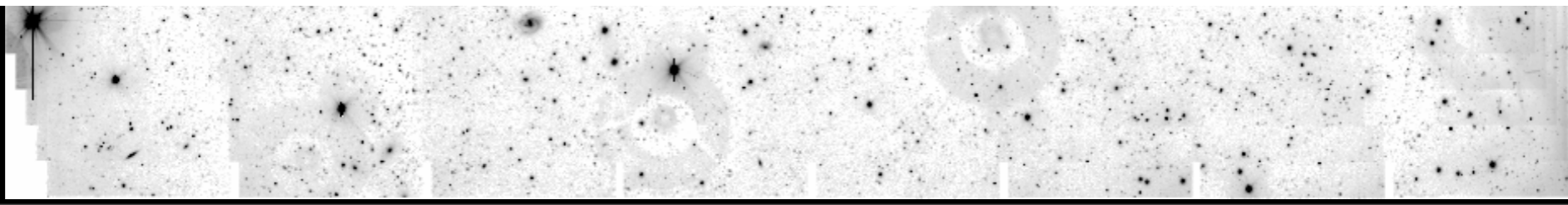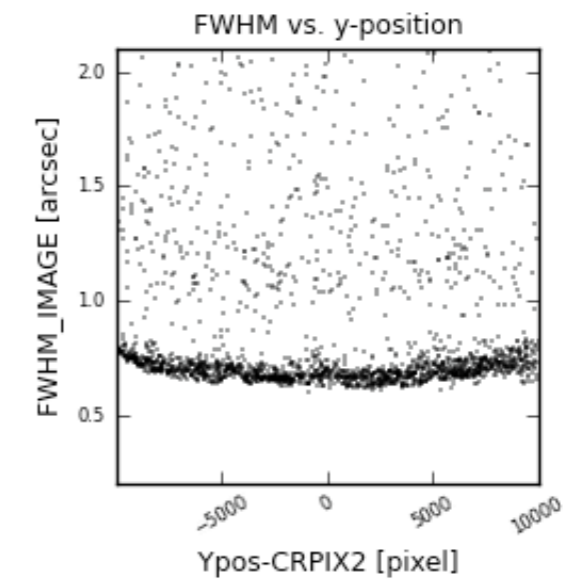
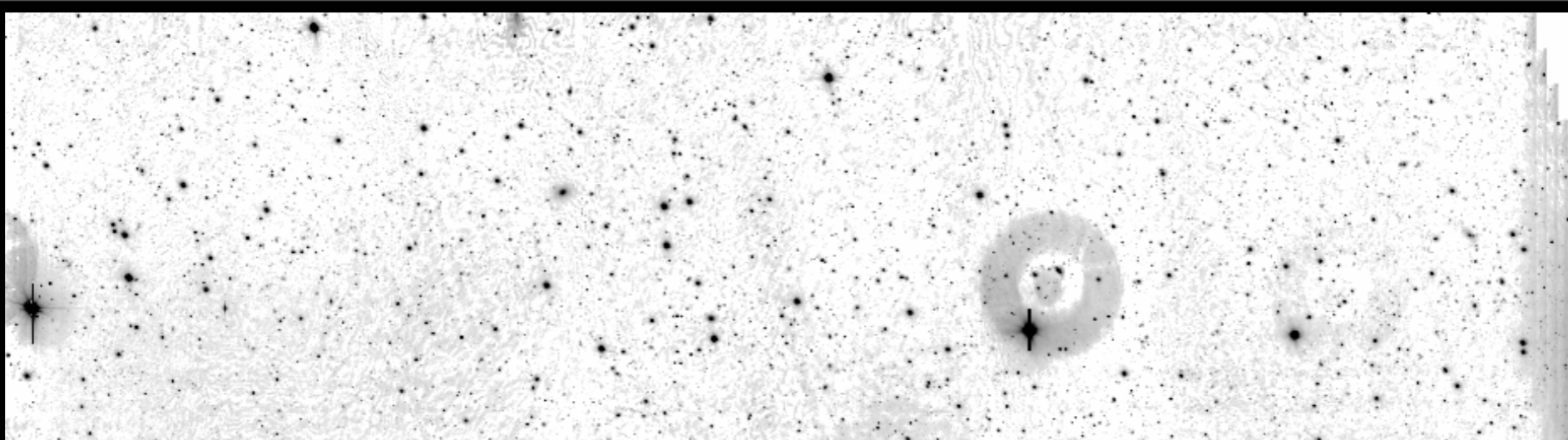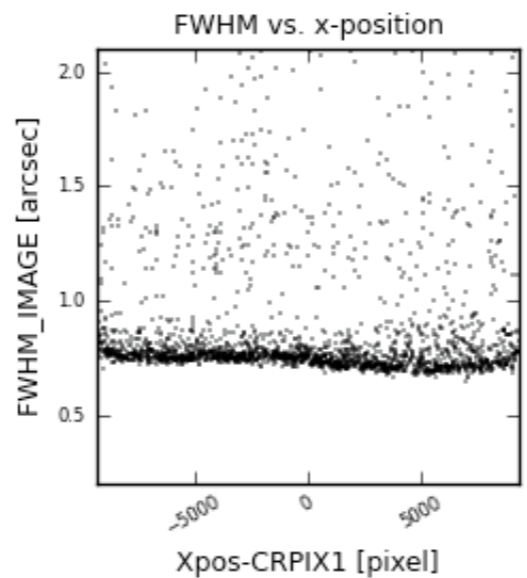PSF Anisotropy for 1 frame(s) with DATE-OBS ??, filter OCAM_i_SDSS
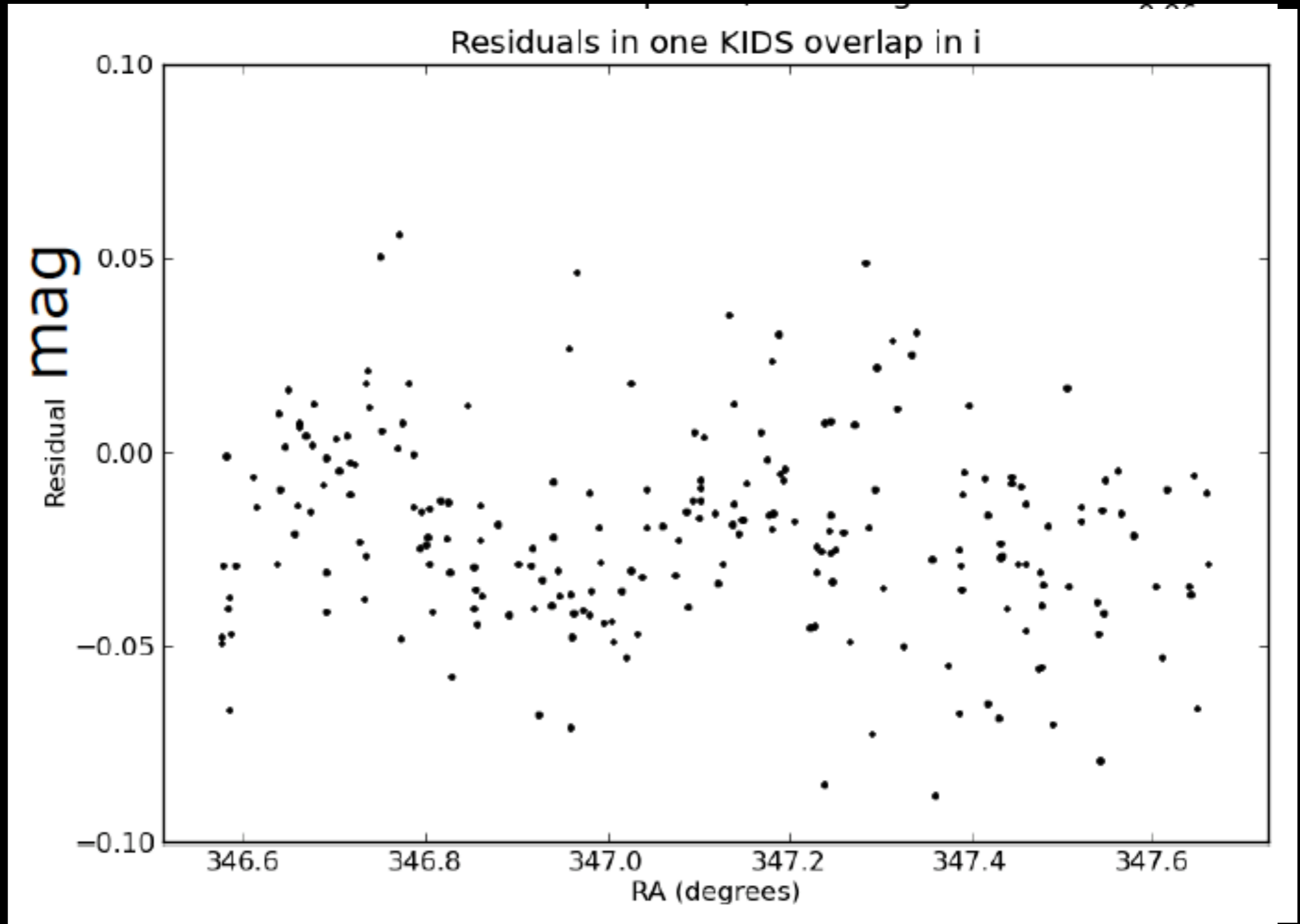KIDS_347.1_-32.1
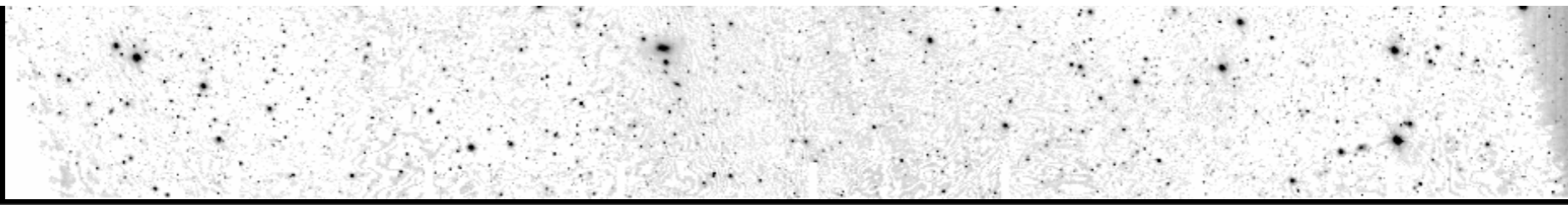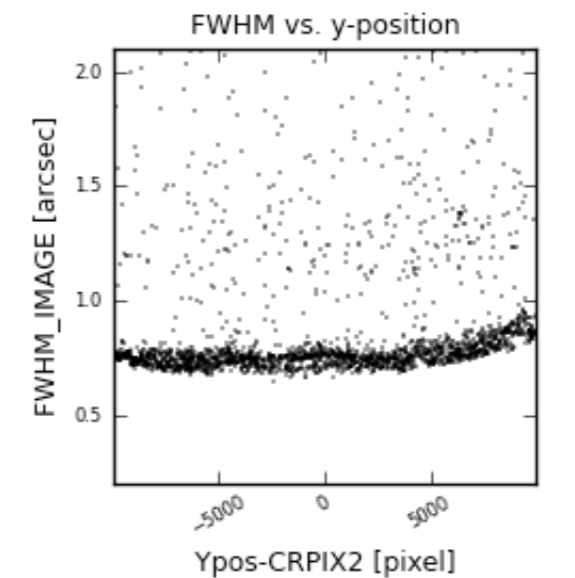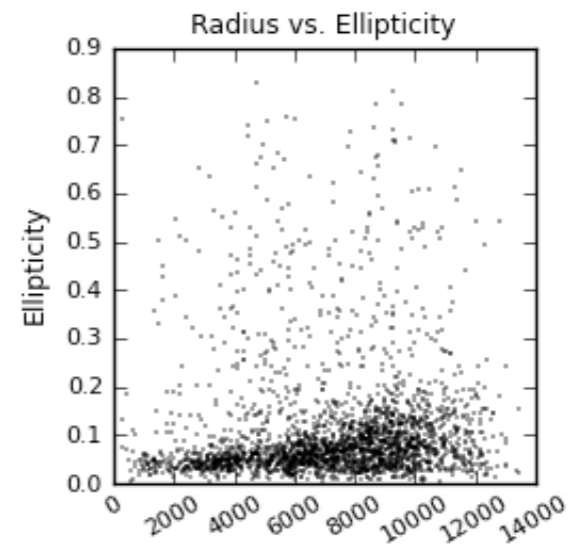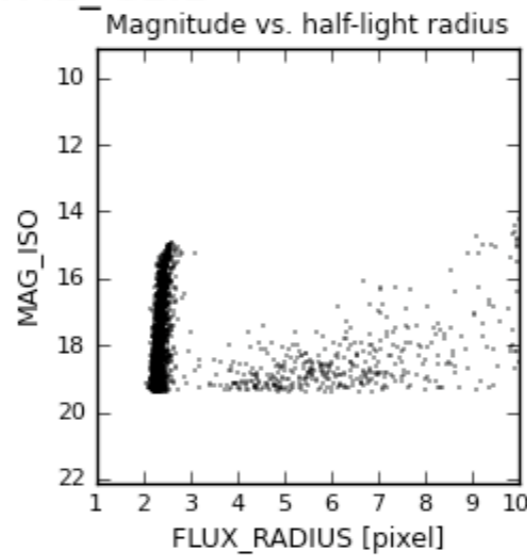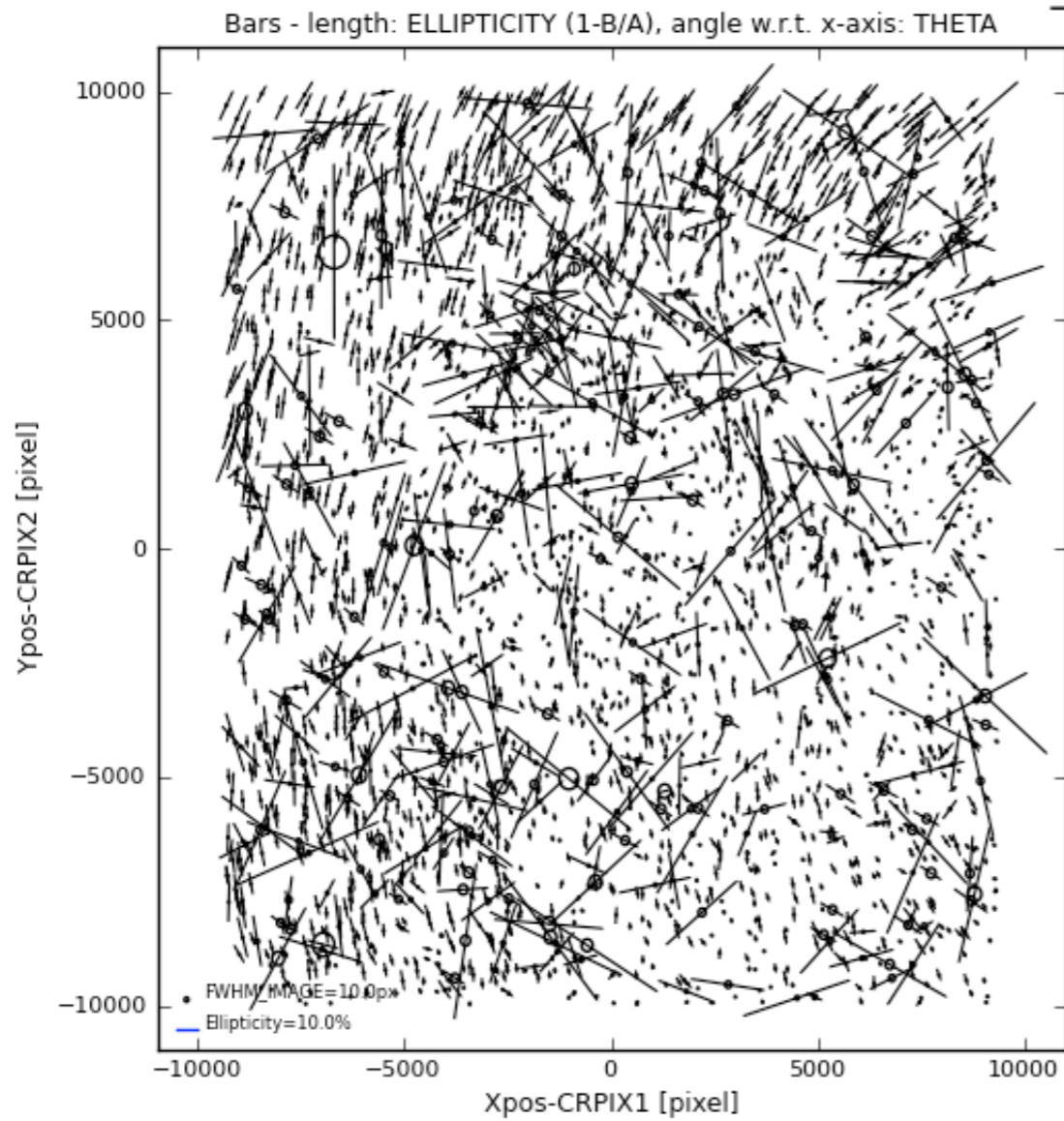
# Data processing

Photometric accuracy in overlap regions

1 night
(03 Oct 2011)

seeing: 0.6",
0.7", 0.8"

exptime = 1200s

# Photometry
# from dithers on SA fields
# …work in progress…

| Photom errors | u | g | r | i |
|---|---|---|---|---|
| stdev internal end-to-end | 0.019 | 0.012 | 0.011 | 0.014 |
| Stdev in <ZPT> for mosaic | 0.011 | 0.010 | 0.012 | 0.011 |
| Stdev in <ZPT> per ccd | 0.037 | 0.010 | 0.016 | ~0.015 |
| D(ZPT) / CCD | 0.015 | 0.005 | 0.005 | 0.007 |

Internal photometry error for single source within dither 1-2%
➤ good hope to get to 1% syst. uncertainty in relative photom.

Also good hope to get to 1.5% absolute photometry per band

More work to be done on ZPT determination per CCD

# VST calibration plan

Calibration data taken at specific intervals:
- biases daily
- dome flats once every three days
- darks once every week
- sky flats every clear night in 2-3 filters (key bands u, g, r, i once every three days)

Master flat fields are combination of dome flats (for small scale variations) and sky flats (for large scale variations)

# VST calibration plan

Zeropoints derived based on:

- sky transparency and instrument efficiency measurement 3 times per night, by monitoring polar standard field in composite u,g,r,i filter
- at evening twilight and midnight standard star field is observed with composite u,g,r,i filter + individual key filters
- If 'user band' is used, standard field also observed in this filter

Due to North pointing restrictions, southern secondary standard fields being defined

# VST calibration plan