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KiDS Strong Lensing

This is the Kapteyn/OmegaCEN homepage for the KiDS Strong Lensing project.

Status (last updated 1 Sep 2014 (GVK))

- Strongly-lensed QSO portal: Strongly Lensed QSOs with KiDS
- Aug14: Added KiDS-LOW-LRG-TWO package to support KiDS/BLF challenge
- May14: “No KiDS Lens No Glory” May 1-2, 2014 meeting at Kapteyn. Euclid SLWG lens finding specialists applied their strong lens finding tools to KiDS data:
  - meeting collaborative notes

KiDS testset for lens finding

We have prepared datapacks:

Set	Datapack	HumVI rgb	Cut-out view	Description
KiDS-LOWZ-LRG-TWO	KiDS-LOWZ-LRG-TWO.tar	-	cutouts.html	Second set of photometrically selected z<0.4 Luminous Red Galaxies. See first set, KiDS-LOWZ-LRG package, below for details
KiDS-START	KiDS-START.tar	in KiDS-START.tar	cutouts.html	Hand-picked start set

Set	Datapack	HumVI rgb	Cut-out view	Description
KiDS-HIGHZ-LRG	KiDS-HIGHZ-LRG.tar	KiDS-HIGHZ-LRG.HumVI.tar newscale	cutouts.html	Photometrically selected z>0.4 Luminous Red Galaxies
KiDS-LOWZ-LRG	KiDS-LOWZ-LRG.tar	KiDS-LOWZ-LRG.HumVI.tar	cutouts.html	Photometrically selected z<0.4 Luminous Red Galaxies
KiDS-QSO				soon: Photometrically selected QSOs
KiDS-TEST	KiDS-TEST.tar	KiDS-TEST.HumVI.tar	cutouts.html	test set using z>0.4 LRG selection.
KiDS-TEST-LARGE-GAL	KiDS-TEST-LARGE-GAL.tar	KiDS-TEST-LARGE-GAL.HumVI.tar	cutouts.html	test set using z<0.4 LRG selection to obtain angularly larger galaxies.
KiDS-TEST-QSO	KiDS-TEST-QSO.tar	KiDS-TEST-QSO.HumVI.tar	cutouts.html	Photometrically selected QSOs
KiDS-TEST-RANDOM	KiDS-TEST-RANDOM.tar	KiDS-TEST-RANDOM.HumVI.tar	cutouts.html	Random locations around HIGHZ-LRG candidates.
KiDS-BLUEPAIRS	KiDS-BLUEPAIRS.tar	in KiDS-BLUEPAIRS.tar		Blue Pairs
KiDS-PSF	PSF_KiDS.tar			FITS images of (hopefully representative) KiDS PSF models (based on shapelets)

General description datapacks

Each datapack contains:

- README.txt (general summary information)
- <datapackname>.pdf (more detailed information)
- per source cut-outs of coadd images and of associated weight images in the 4 KiDS filters u, g, r and i.
  - size 100pix x 100pix = 20“ x 20”
- naming convention: <KiDS_tilename><radecOfSource><filtername><SLIDSIDofSourceList><r if random>__<size>.fits/weight.fits
  - SLID, SID are SourceList and Source IDentifiers in Astro-WISE system.
  - character r is appended if it are random cut-outs instead of centered on candidate sources
  - size is in pixel units (0.2“/pix)
- Units coadd images: mag=-2.5*log10(pixelvalue)
- units weight images: inverse variance images using same unit convention as coadd images (only background noise!).

- png thumbnails and cutouts.html (for browser view on cutouts)
- may2014meeting.py: python code used to generate datapack from Astro-WISE python prompt.

Content to be added next:

- color images

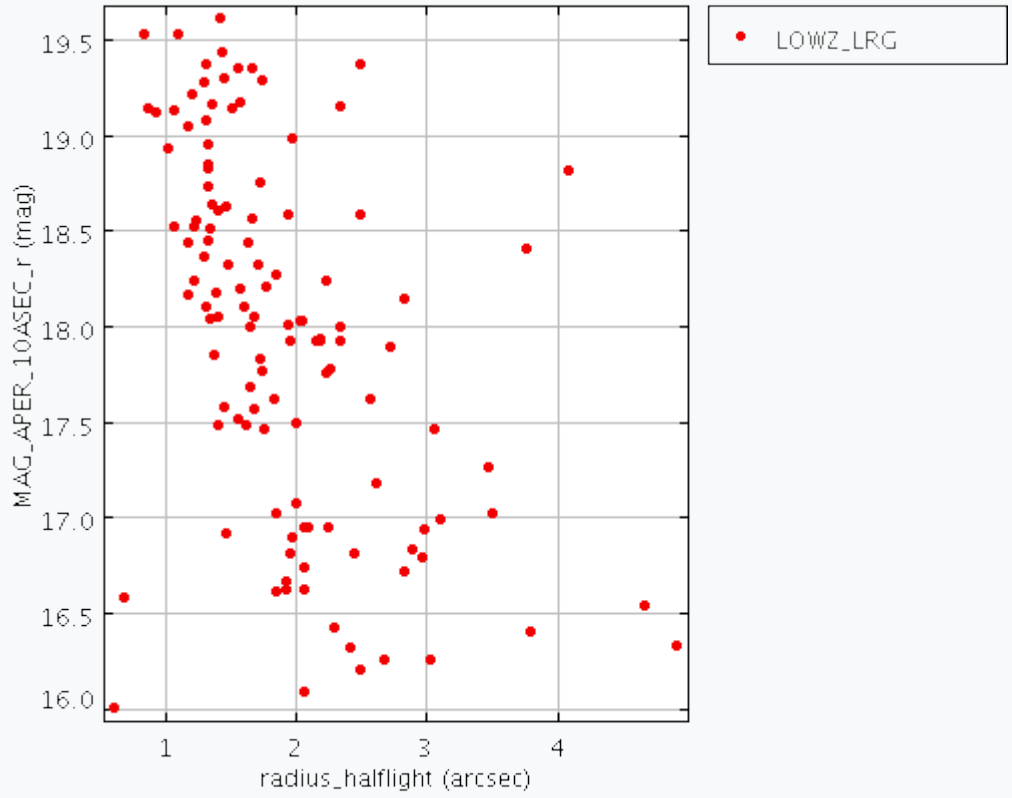
KiDS-LOWZ-LRG datapack description

We have prepared a set of 5322 LRG candidates. Selection is aimed to get z<~0.4 luminous red galaxies. They are selected photometrically in 69 KiDS tiles (each approx. 1sq.deg.) The photometric selection is based on the BOSS LOWZ selection, adapted to KiDS:

- |c_perp| < 0.2
- r < 13.5 + c_par/0.3
- 16 < r < 19.6
- SGCLASS_r==2 (means extended object in r)

where magnitudes are in 10 and 2 arcsec diameter apertures and we have used the following auxiliary colors:

- cpar = 0.7(g - r) + 1.2[(r - i) - 0.18)]
- cperp = (r - i) - (g - r)/4.0 - 0.18



Aperture magnitude vs radius containing 50% of the light for example set.

KiDS-HIGHZ-LRG datapack description

We have prepared a set of 7409 LRG candidates. They are selected photometrically in 80 KiDS tiles (each approx. 1sq.deg.)
The photometric selection is based on the BOSS CMASS selection, adapted to KiDS:

- dperp > 0.55 (with dperp = (r-i) - (g-r)/8.0, and all magnitudes in 2arcsec apertures)
- i < 19.86+ 1.6(dperp - 0.8)
- 17.5 < i < 19.9
- r - i < 2
- SGCLASS_r==2 (means extended object in r)

KiDS-TEST-QSO datapack description

We have prepared a testset of 5557 QSO candidates. Selection is aimed to get 0.5<z<2 QSOs. They are selected photometrically in 37 KiDS tiles (each approx. 1sq.deg.) The photometric selection is:

- SGCLASS_r==1 (means point source in r)
- 0.0<u-i<1.0
- r<22.0

where magnitudes are in 2 arcsec diameter apertures.

KiDS-TEST datapack description

We have prepared a testset for 564 LRG candidates. They are selected photometrically in 5 KiDS tiles (each approx. 1sq.deg.)
The photometric selection is same as HIGHZ-LRG datpack (see above).

KiDS-TEST-LARGE-GAL datapack description

We have prepared a testset for 810 LRG candidates. Selection is same as KiDS-LOWZ-LRG (see above)

KiDS-TEST-RANDOM datapack description

We have prepared a testset for 472 “random” KiDS locations. These are cut-outs centered on points uniformly selected in a square box of 1arcmin size around HIGHZ-LRG candidate locations in 5 KiDS tiles.

KiDS-PSF datapack description

Konrad Kuijken has modeled the PSFs in u, g, r and i for one KiDS tile. Each at 5 locations in the FoV. Model is based on shapelet analysis. Hopefully they are representative enough in this early phase to test lens-finding tools on KiDS data.
See release note at KiDS-ESO-DR1 Consortium Portal for a typical distribution of seeing in KiDS data.

Input KiDS area

We can use 173 tiles (~173 sq.deg.) in the KiDS area that have completed coverage (i.e., u,g,r and i). This set is called KiDS-INT-DR3.

- KiDS-INT-DR3 synoptic table
- coming soon: KiDS-INT-DR3 four-band catalogs
- KiDS-INT-DR3 Consortium Portal for more details

- **AI: JdJ/GVK**: 140319: one coadd missing, KiDS-INT-DR3 sourcelists missing.

Handy links / references

- KiDSLensFinding shared GoogleDoc
- Euclid SLWG wiki on redmine
- 1-2 May meeting Groningen page
- KiDS+VIKING Combined Catalogs
- may2014meeting.py Astro-WISE python script to make datapacks