PARAMETRIC FITS

- The parametric fits describe the HRI galaxies
  - i.e., we describe these galaxies by mathematical functions.
- Favourite function: Sérsic function
  - BEWARE: Sersic is only an approximation
  - BEWARE: We know galaxies are not symmetric
- Main advantages:
  - Low signal-to-noise objects not so much affected by noise.
  - Crowding is less important as neighbours are taken into account

“MEGAD” (Buitrago+14, in prep.)

- “Multi-CPU” IDL+(IRAF+SExtractor+GALFIT)
- Based on the assumption of small k-correction

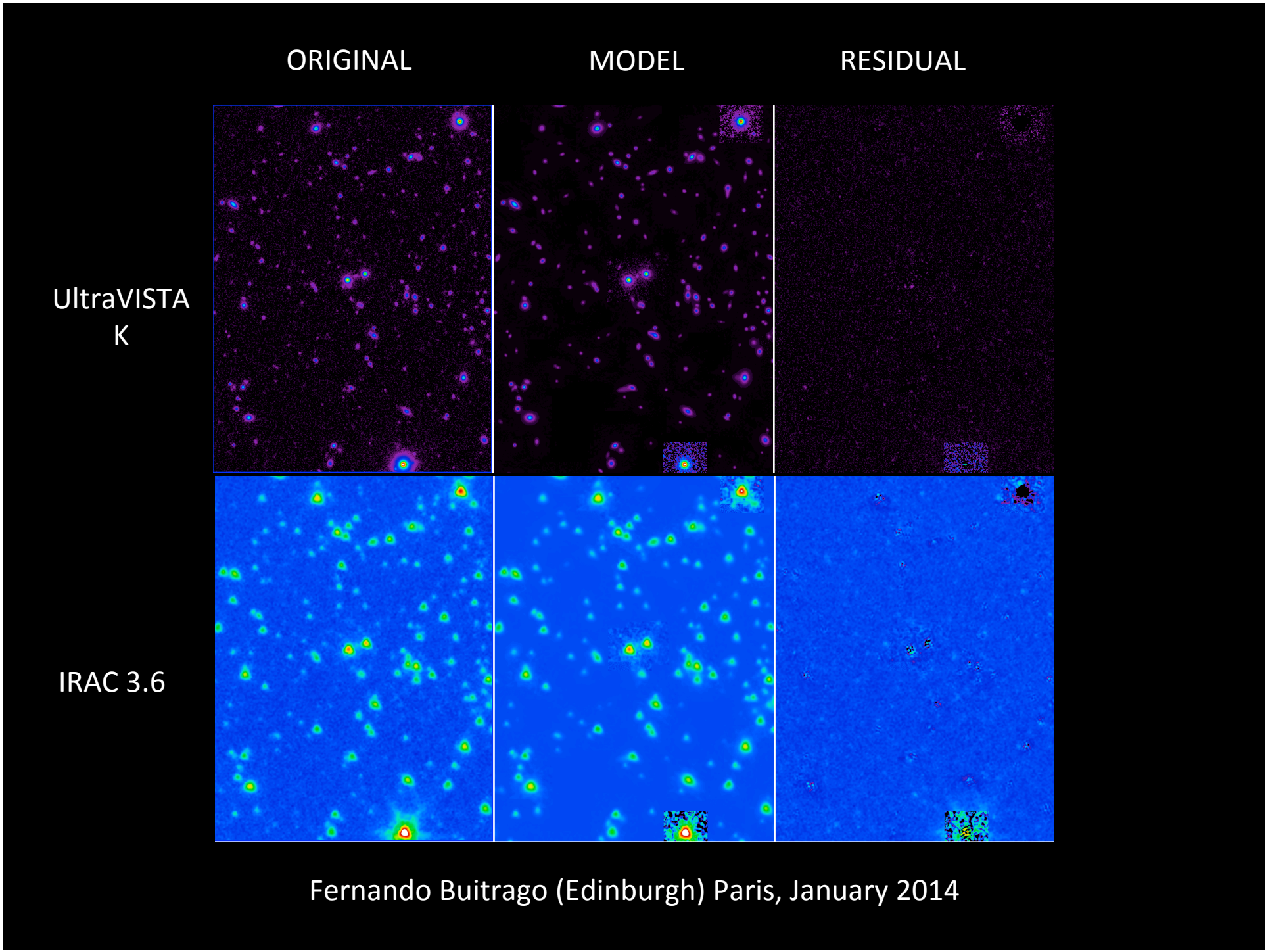
Alignment
- Registering all images to the same WCS
- Resampling all images to the same pixel scale

HRI analysis
- GALFITing (SExtractor provides the initial conditions)
- Number of functions, masks, PSF, etc at choice + Sky

LRI analysis
- GALFITing (all parameters frozen but mags)
- Final models (& residuals) and catalogs

HOW THINGS ARE GOING

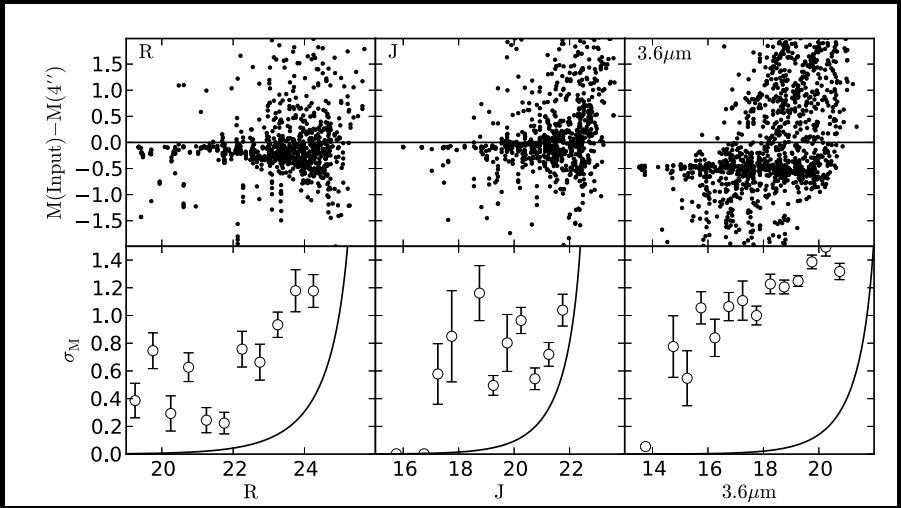
- Many surveys attempted (both ground-based and space) and different number of functions, PSFs and initial conditions
  - Flexibility: clear optimal conditions but we can tune
    - HRI: K-band UltraVISTA, UDS, CANDELS, HUDF
    - LRI: SCOSMOS, SEDS, SpUDS


ORIGINAL
MODEL
RESIDUAL
UltraVISTA
K
IRAC 3.6
Fernando Buitrago (Edinburgh) Paris, January 2014

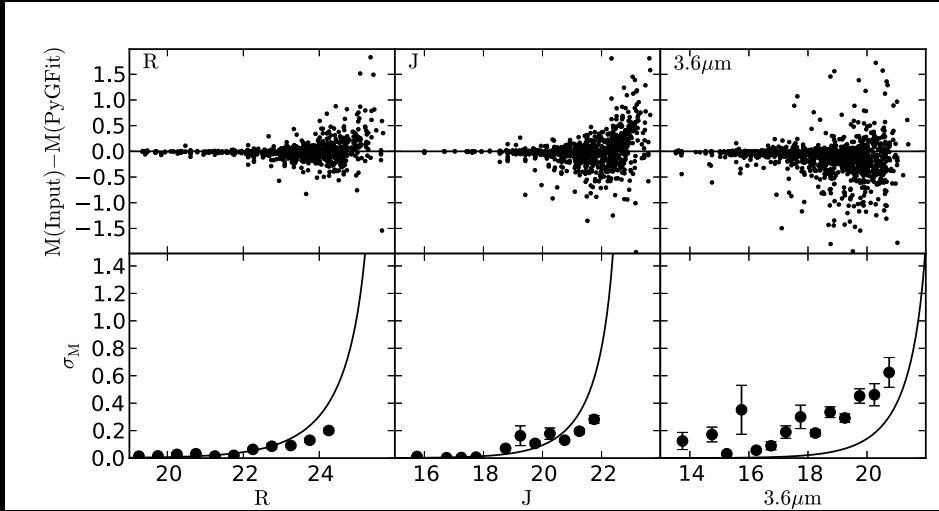
OTHER APPROACHES

- PyGFIT (Mancone et al. 2013)
  - Similar to MEGAD, but does not rely on GALFIT, uses SExtractor segmentation map, removes objects after their analyses, only a single Sérsic function and other minor differences.
- Megamorph (Haeussler et al. 2013)
  - In principle it is not thought to perform deconfusion but multi-band photometry. Parameters change among bands according to Chebysev polinomials. Uses GALAPAGOS.

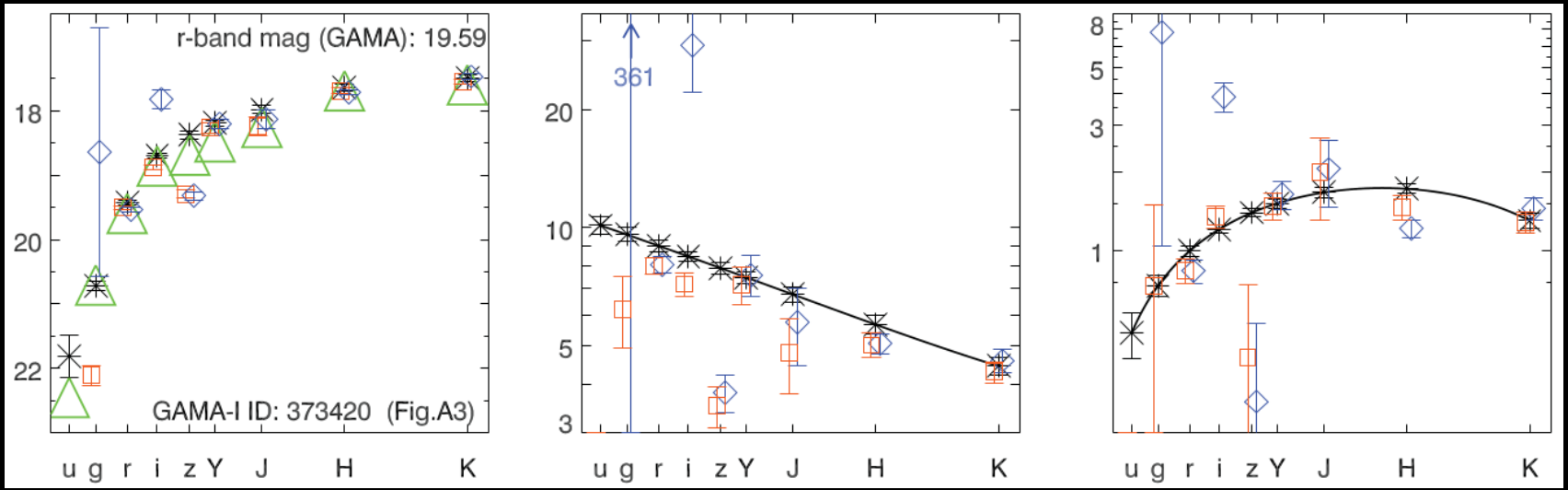
4 arcsec apertures



PyGFIT

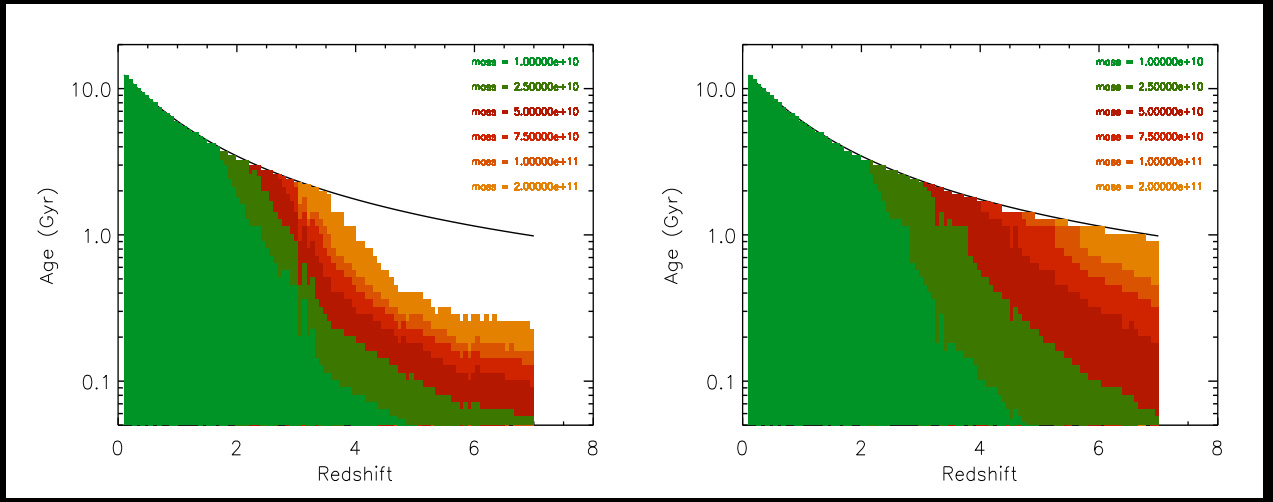


Megamorph



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SCIENCE



- Mass functions improve greatly by having best IRAC photometry (plus the added value of morphological information).
- Very old galaxies (and very red as well).
- This is really one of the ways of getting "super-resolution" in 2-5 microns before JWST!!
  - we must be cautious when sizes << FWHM

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