CFHTLS

December , 2004

Terapix procesing activities

Schedule:

- November 16: release T0001

- Dec.-Jan.   : release T0002
    - Deep, Wide and Very wide 20031/B+2004A/B +
    - new pre-calibrated 2003A/B data +
    - new astrometric tool

- Release updates: each 6 month

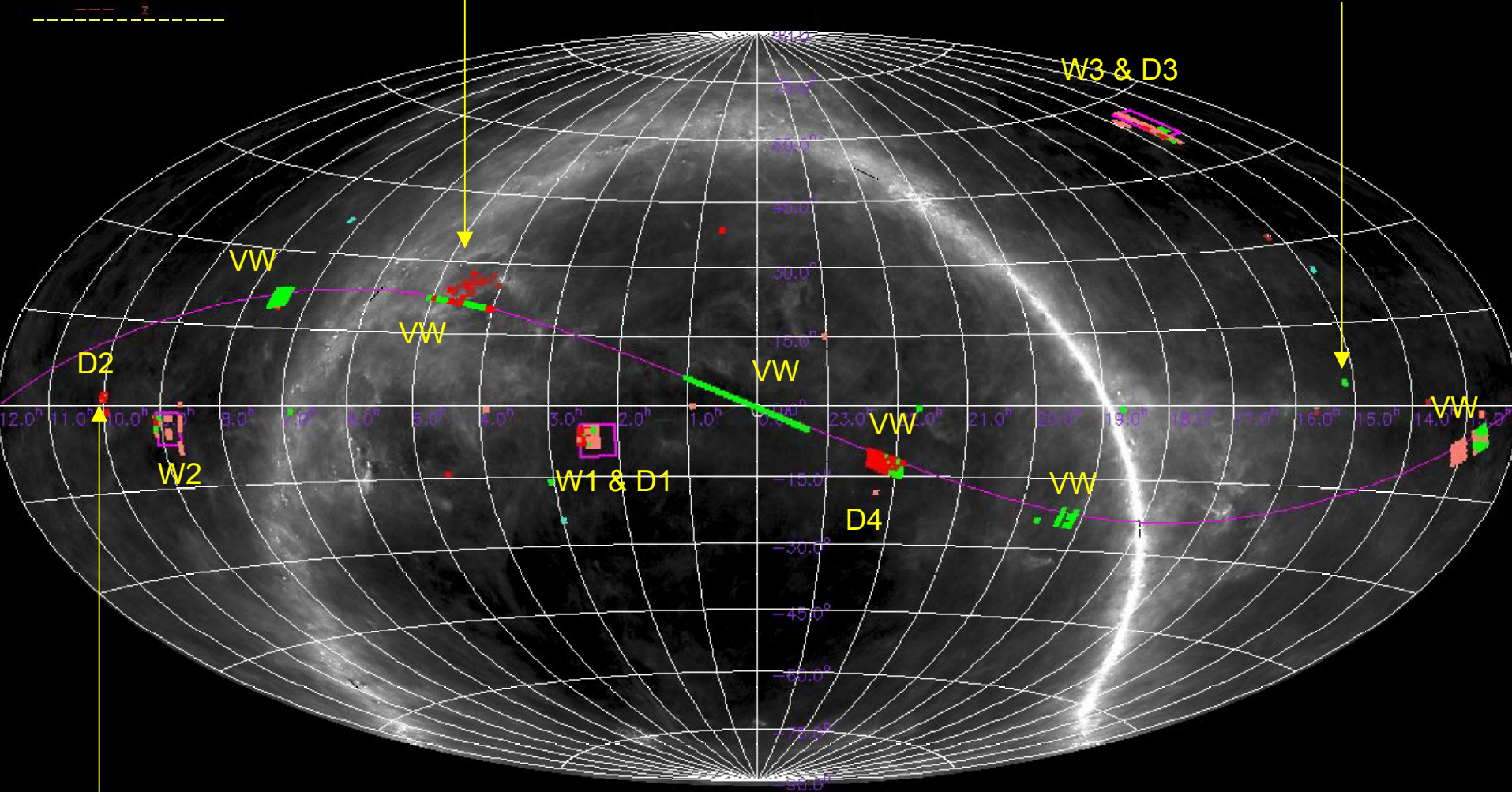- End 2005: fully PSF homogenised release

PIs:

- On going work: 25% of Terapix activities:

    - Le Fèvre, Dougados, Demers, Cayatte, Mellier, Petitjean, Seymour, Davidge, Sanders, Robin

CFHTLS: start July 2003, end August 2008

Legend
g
i
r
u
z

Dougados 03BF09

Mellier 03AF19

W3 & D3

VW

VW

D2

VW

VW

VW

W2

W1 & D1

VW

D4

Le Fèvre 03BF27: Cosmos

Terapix/Skywatcher : all data 03A-03B :   4200 Megacam images

+command line : skywatcher

Qfits and Terapix products for each megacam image

->Acces to Qfits pages to CFHTLS registered users

Qfits and Terapix products for each megacam image

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Data and meta-data sent to CADC for each individual megacam image: *e.g.* 707502p.fits

```
707502p_bkg_histo.png
707502p_bkg_histo.ps
707502p_bkg_m.png
707502p_diag.fits.fz
707502p_ell.png
707502p_flag.fits.fz
707502p_fwhm_histo.png
707502p_fwhm_histo.ps
707502p_gal_histo.png
707502p_gal_histo.ps
707502p.ldac
707502p_m_med.png
707502p_m.png
707502p_psf_m.png
707502p_rhmag_gal.png
707502p_rhmag.png
707502p_rhmag_star.png
707502p_star_histo.png
707502p_star_histo.ps
707502p_weight.fits.fz
707502p_wmm_med.png
707502p_wmm.png
707502p.xml
```

CFHTLS T0001 Nov. 16 Release

CFHTLS Release T0001: summary table.

by **FMA** - Updated December 1st, 2004

Back to Terapix T0001 main page.

TERAPIX release products	Details given in explanatory table

▸ Release reference identification : **T0001 - Nov. 12, 2004**
▸ CFHTLS Deep fields: D1, D2, D3 and D4

Selection criteria:
▸ Data obtained between June 1st, 2003 and July 22, 2004
▸ Terapix Class : A or B
▸ Exp. time > 60 sec.
▸ Seeing < 1.1" , except for u (<1.4")
▸ Airmass < 1.4
▸ D4-z data missing : astrometric solutions do not match other filters. Data will be released later.

▸ Magnitudes are AB MEGACAM instrumental system.

- Total selected : 906 images + 906 weightmaps
- Total exp. Time :101 hrs

| CFHTLS Field	CFHTLS Deep synoptic D1					CFHTLS Deep synoptic D2					CFHTLS Deep synoptic D3					CFHTLS Deep synoptic D4				
Filter	u	g	r	i	z	u	g	r	i	z	u	g	r	i	z	u	g	r	i	z
Stacked image (FITS. Selected images are listed in *.lst files)	Y	Y	Y	Y	Y	Y (CCD#03 missing)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N
RA , DEC (J2000)	02:25:59 , -04:29:40					10:00:28 , +02:12:30					14:19:27 , +52:40:56					22:15:31 , -17:43:56				
Nb files stacked	16	37	48	100	34	7	24	17	38	28	7	37	64	127	42	28	56	78	118	-
Exp. time (s)	10560	7515	17280	52000	12240	2520	5400	6060	18500	10080	4620	8010	20820	59640	15120	16680	11250	26400	58800	-
Seeing (")	1.15	0.98	0.87	0.88	0.86	0.88	0.98	0.89	0.95	0.84	0.88	0.95	0.93	0.92	0.85	1.05	0.99	0.85	0.88	-
Mag. ZP	30.	30.	30.	30.	30.	30.	30.	30.	30.	30.	30.	30.	30.	30.	30.	30.	30.	30.	30.	-
Pixel size (")	0.1860	0.1860	0.1860	0.1860	0.1860	0.1860	0.1860	0.1860	0.1860	0.1860	0.1860	0.1860	0.1860	0.1860	0.1860	0.1860	0.1860	0.1860	0.1860	-
Image size (pix.)	20404 x 21547					20324 x 21442					19486 x 20482					20397x21475				
Effective FOV (=area in deg2)	0.80					0.69					0.77					0.77				

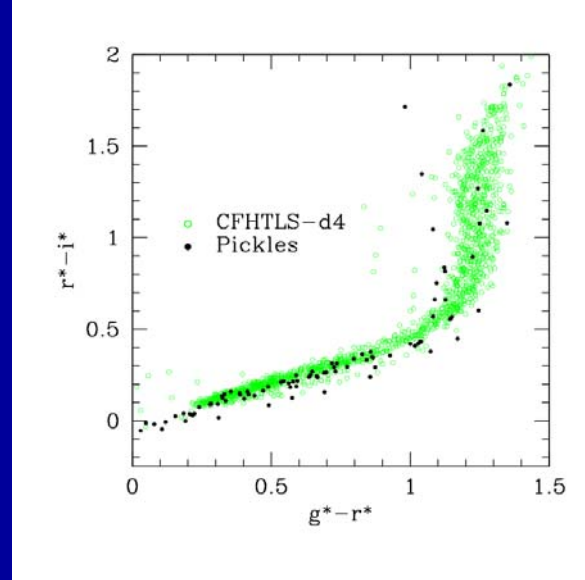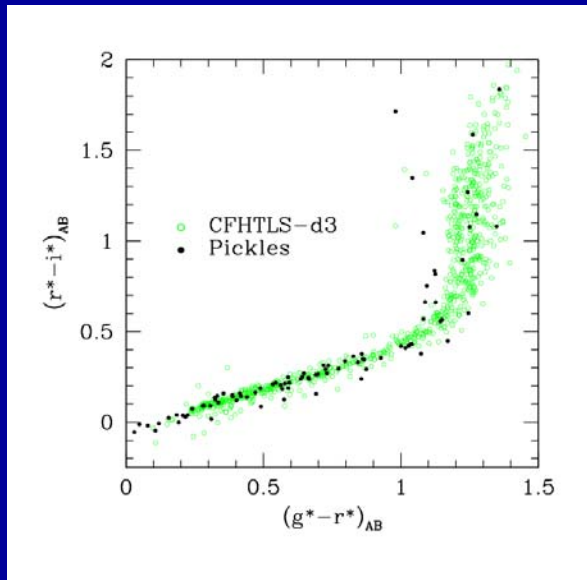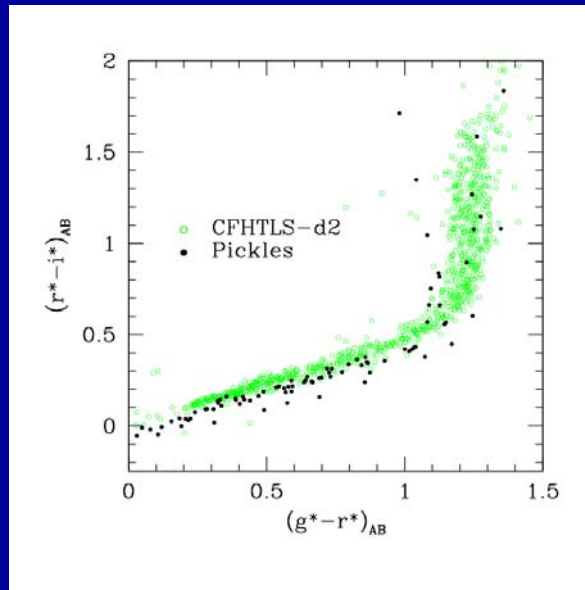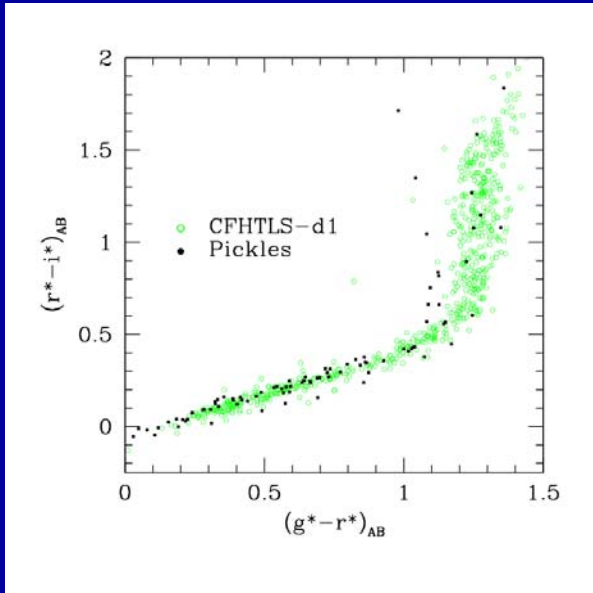->Release pages at Terapix and CADC

T0001:
Completness

Z band: all ready except D4
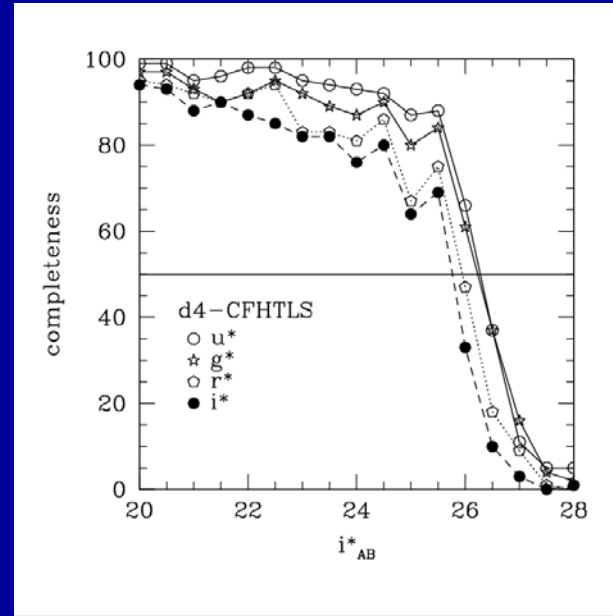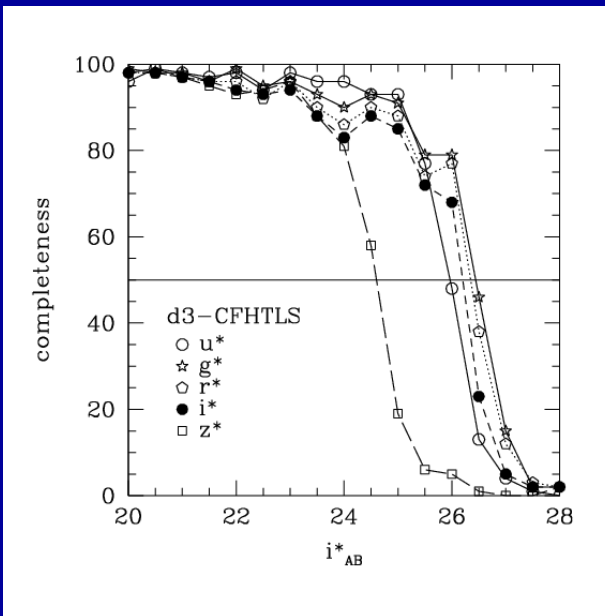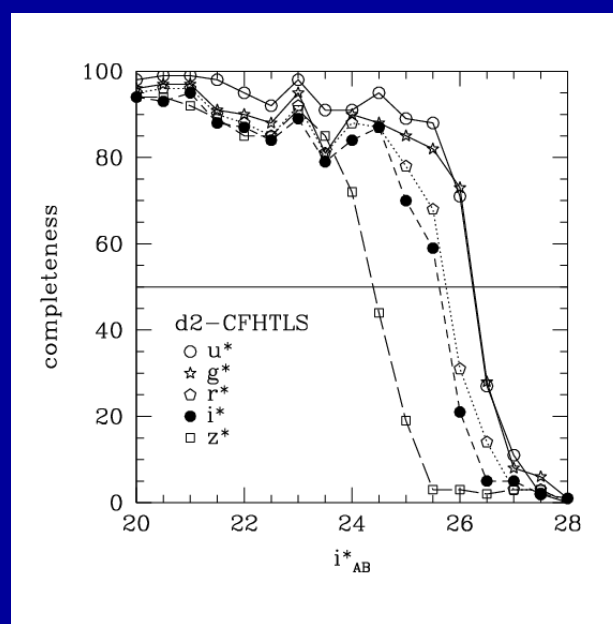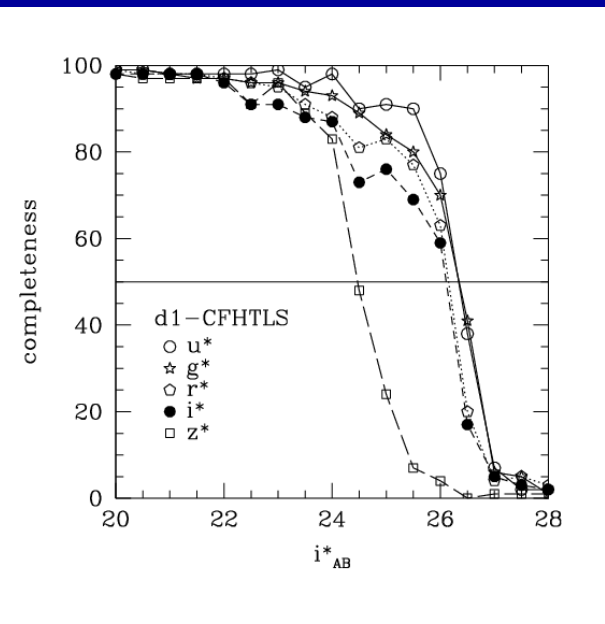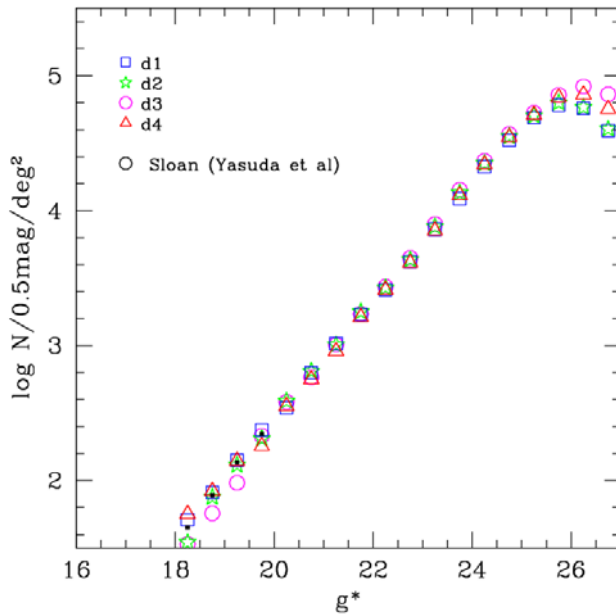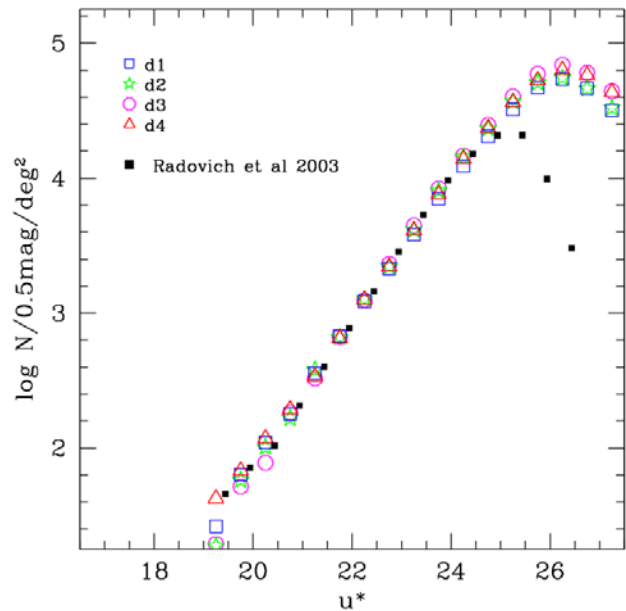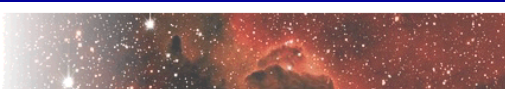
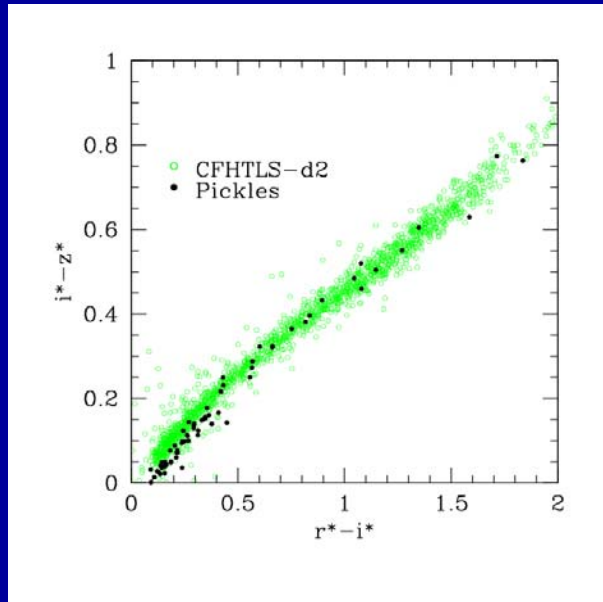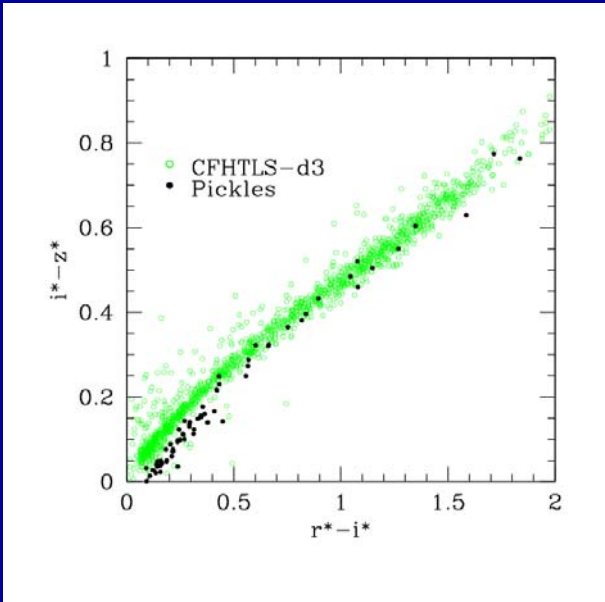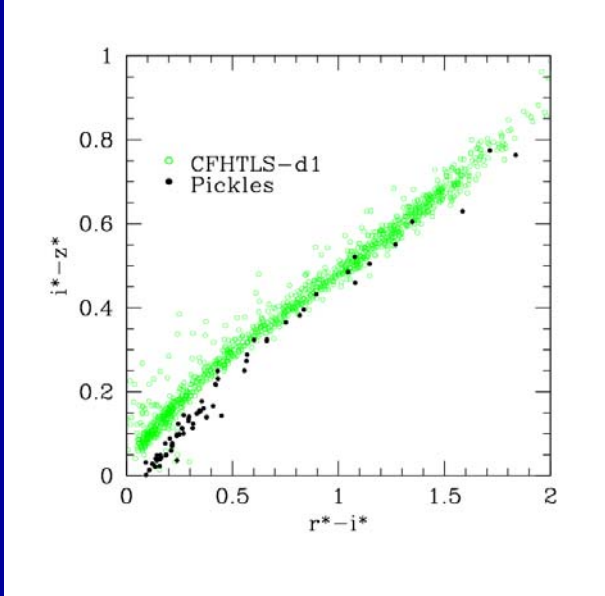T0001: Galaxy counts
Z band: all ready except D4
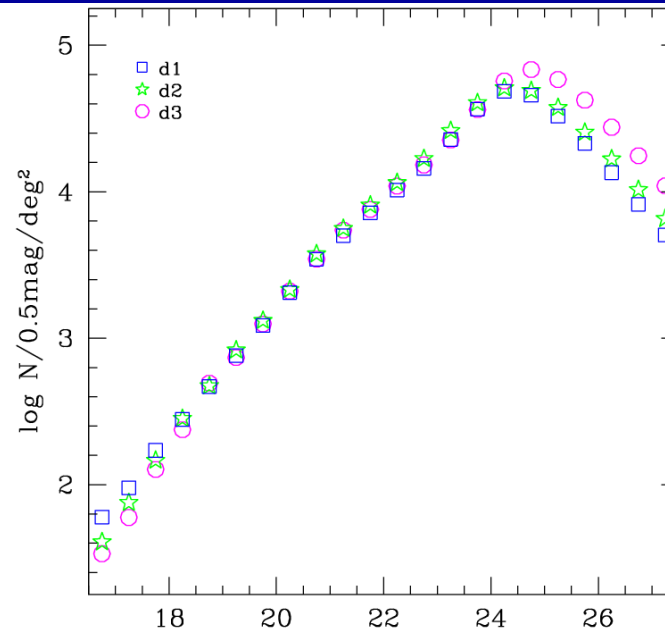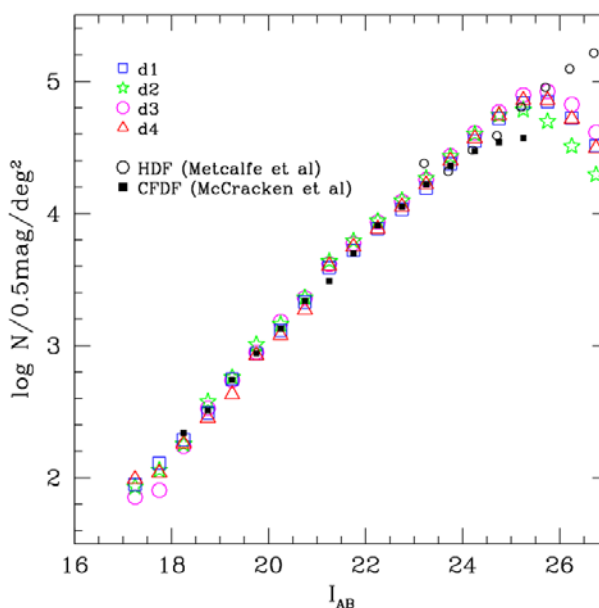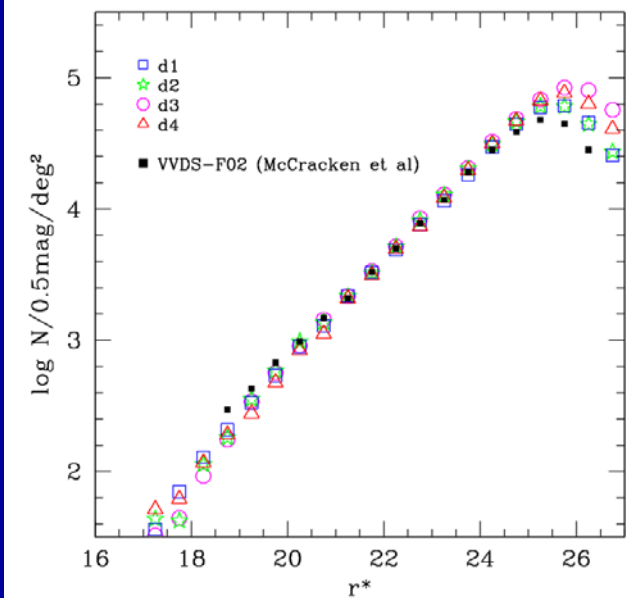
T0001:
gri stellar color-color tracks

Pickles's track indicative (shift due to metalicity)
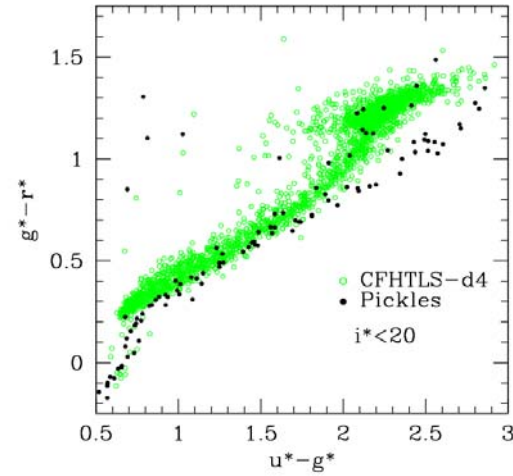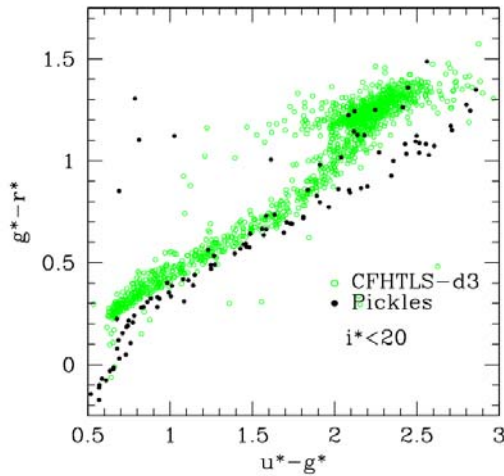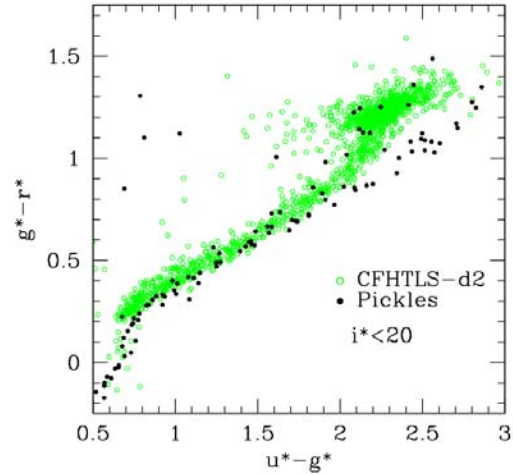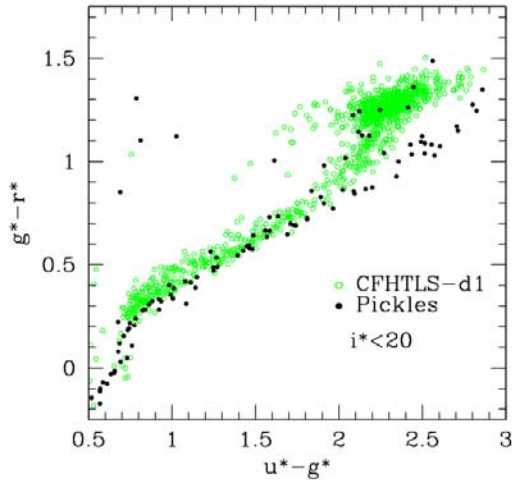
T0001: riz stellar color-color tracks

Pickles's track indicative: no atmospheric and E(B-V) corrections
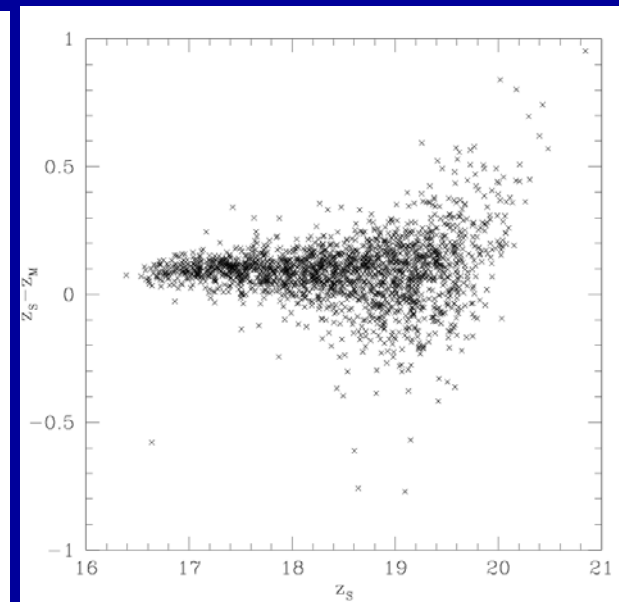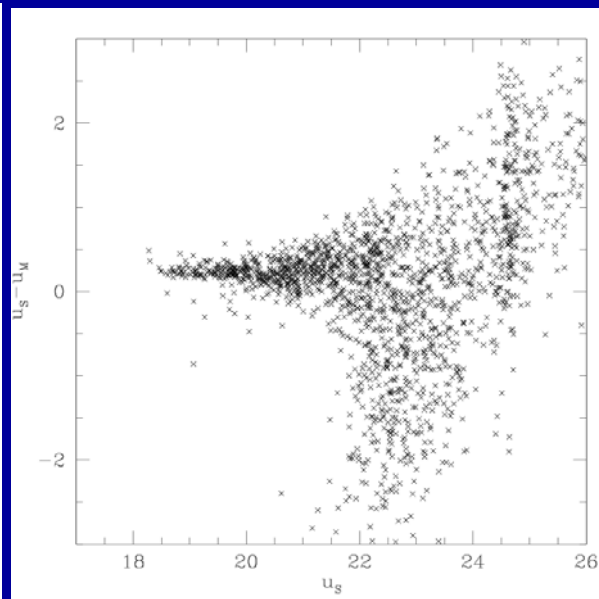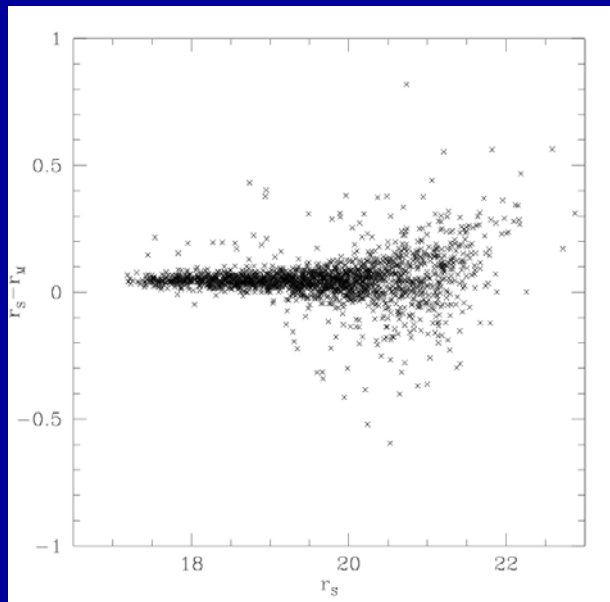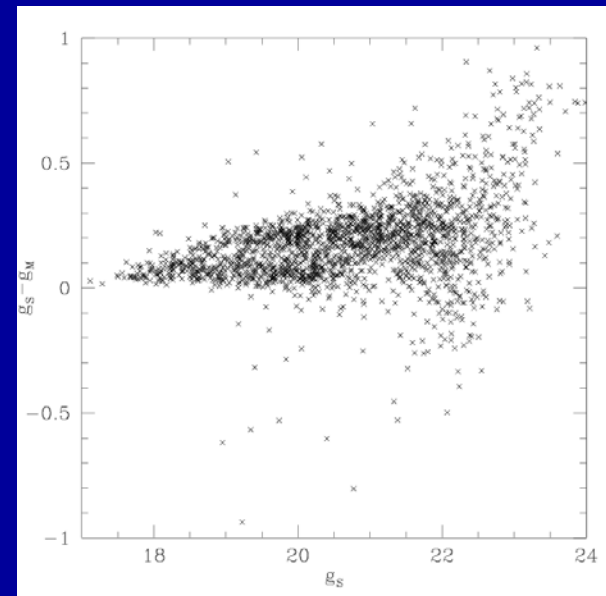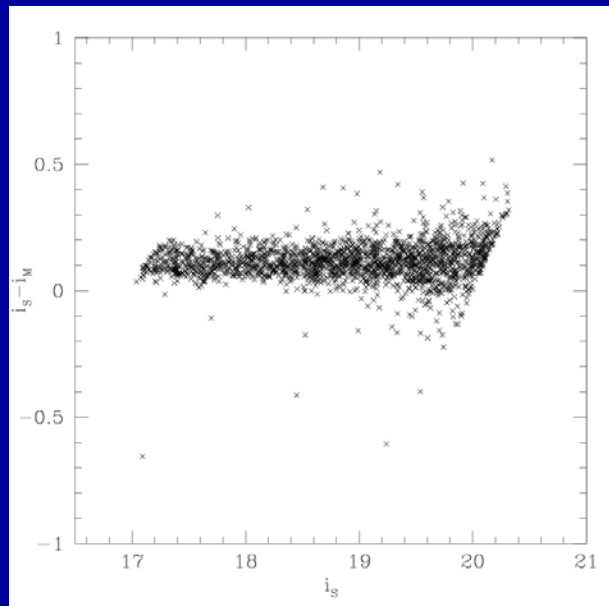
D4-z mising

T0001:
ugr stellar
color-color
tracks

Pickles's track
indicative: no
atmospheric nor
E(B-V)
corrections

T0001: Photometric calibration: SDDS vs. CFHTLS

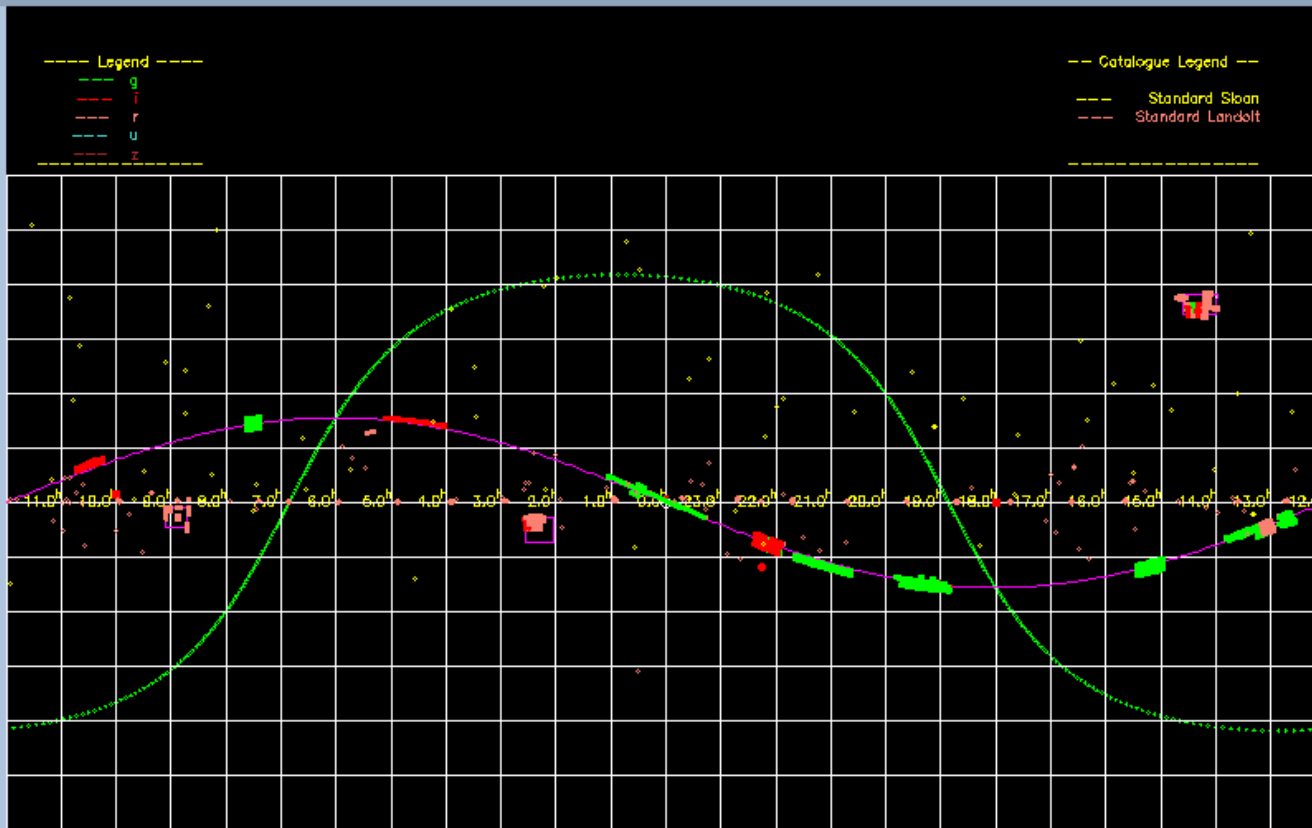Offset only to use of MagAuto

Terapix and C. Marmo

T0002 release in progress

- Data between June 1st 2003 and Oct. 22, 2004
- D1, D2, D3, D4, W1, W2, W3 + VW
- u,g,r,i,z
- About 6000 CFHTLS images (+ weightmaps)
- Use new master flats for 03B data
- Exp. time > 60 seconds
- Seeing < 1.1''; except u (<1.4 '')
- Airmass < 1.4
- Class Terapix   (output image quality):A ou B
- u,g,r,z stacks aligned to i-band stacked images

T0002 sky coverage

Terapix/ SkyWatcher: CFHTLS follow up
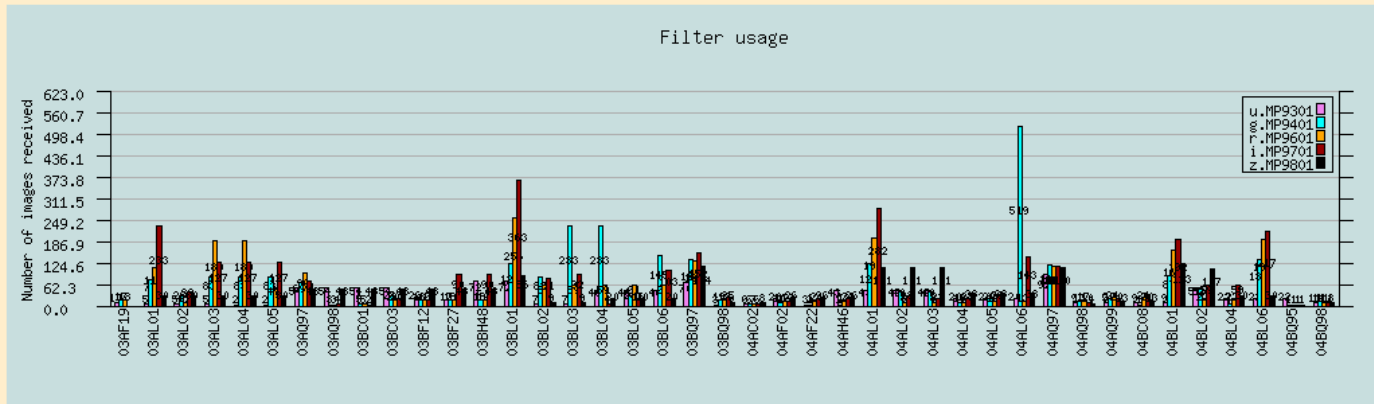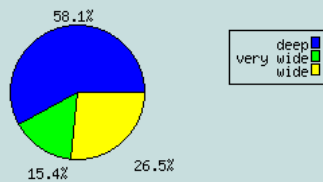
T0002: statistics
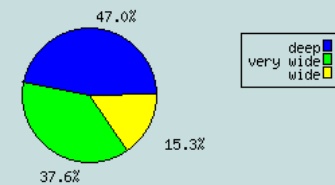
T0002: Validated Data as of Oct. 22

Field	u*	g'	r'	i'	z'	hours
1hr grey s/n=10 AB	25.20	25.7	25.3	24.9	23.9	
D1	2.57	5.50	15.49	31.72	10.1	65.38
D2	1.28	2.13	5.75	11.46	3.00	23.62
D3	1.28	5.59	15.13	33.41	9.01	64.42
D4	7.90	7.94	17.42	37.08	15.6	85.94
W1	9.99	14.72	8.09	23.17	7.33	63.3
W2		4.17	3.06	0.69		7.92
W3		9.45	3.91	12.75		26.1
V Wide		22.6	11.74	34.07		68.4

Total: 402 hrs   (T0001: 101 hrs)

On going T0002 release

T0002: sample astrometry

CFHTLS_VW_g_215913-114923

Group #1: detections
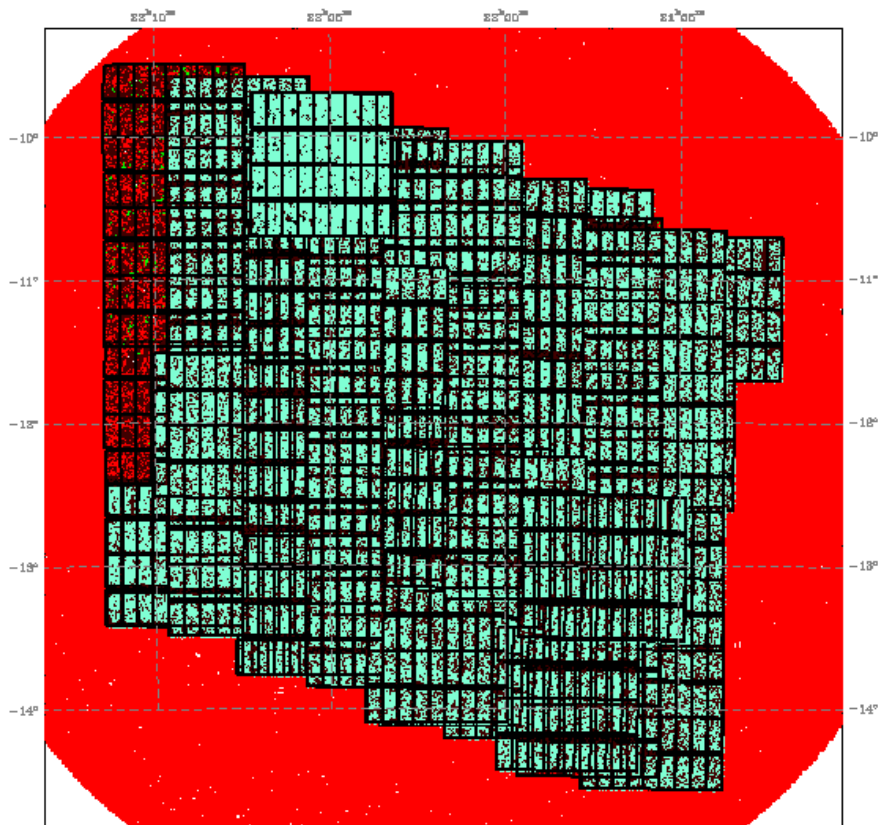
Internal Stats (All)	
dAXIS1	0.07442
dAXIS2	0.06573
chi2	19.2585
ndets	1595883
Internal Stats (High S/N)	
dAXIS1	0.04793
dAXIS2	0.03106
chi2	56.0307
ndets	346432
External Stats (All)	
dAXIS1	0.31918
dAXIS2	0.31569
chi2	21.7578
ndets	116957
External Stats (High S/N)	
dAXIS1	0.23375
dAXIS2	0.23157
chi2	17.1922
ndets	61563

CFHTLS_VW_g_215913-114923
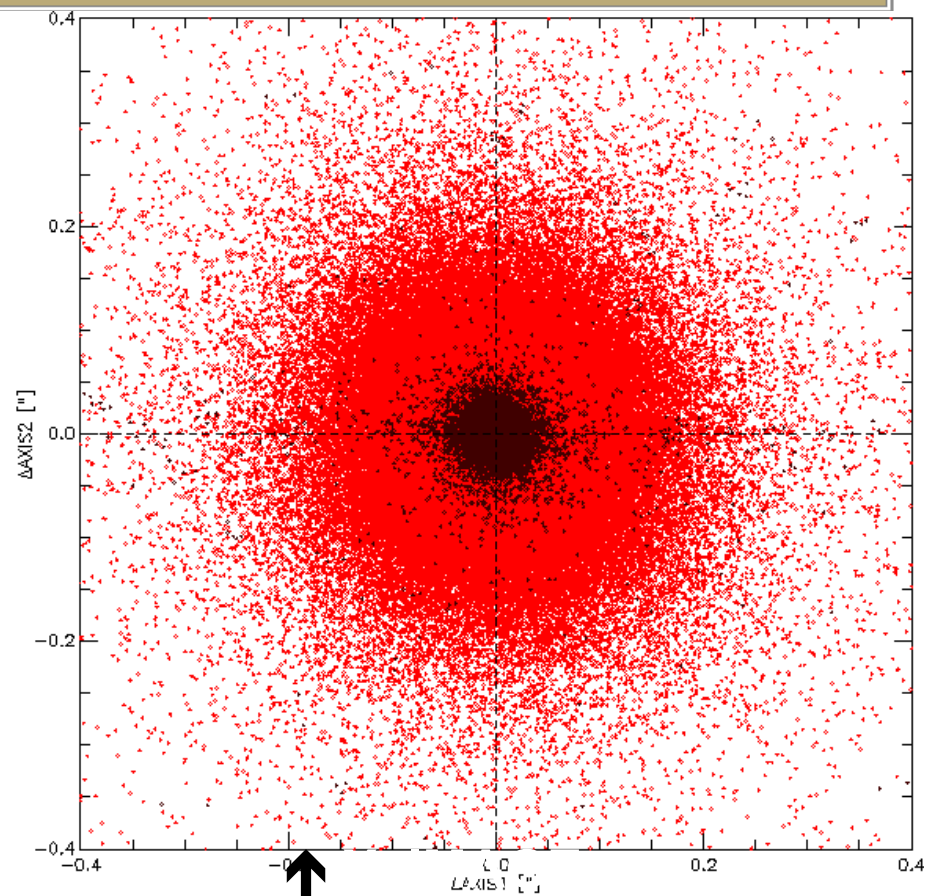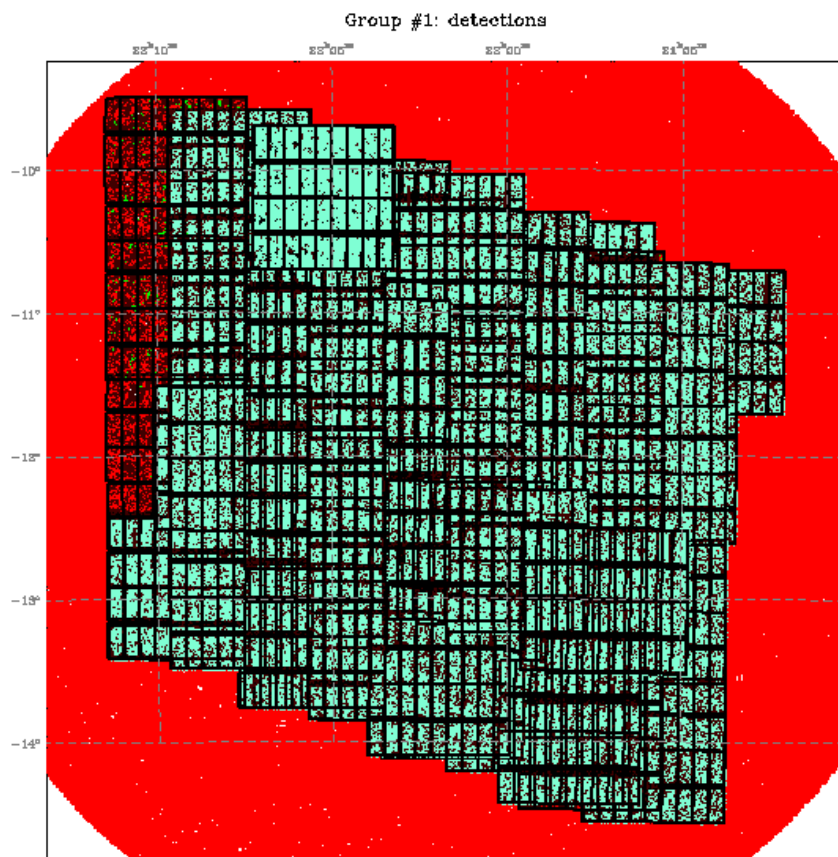
σ_x = 21 mas

Next releases:
Comparison with the reference catalog (USNO-B1)

Next releases:
Tracking photometry zero-points
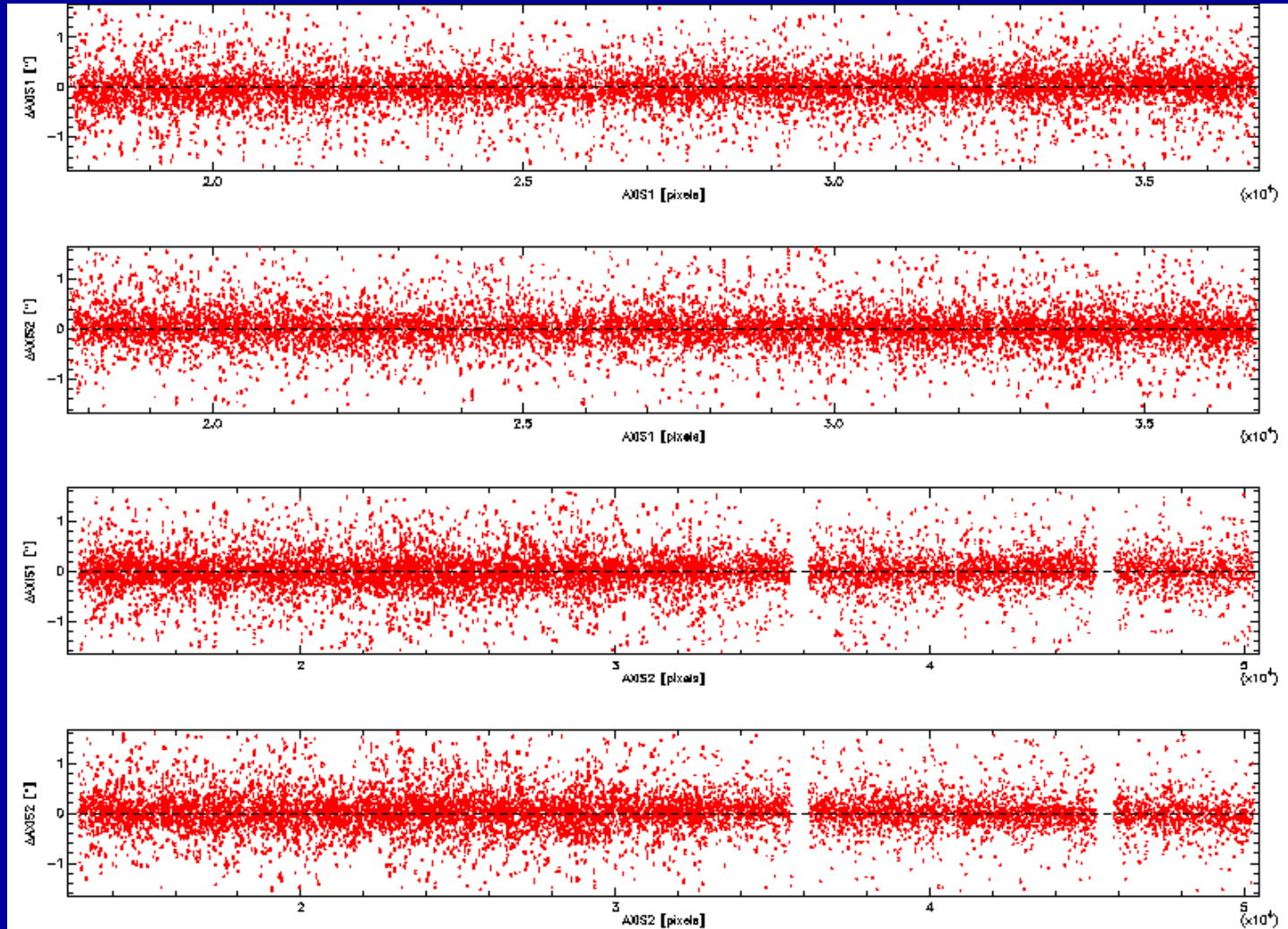
T0002 release:
Astrometry: SCAMP

- Compute astrometric and photometric solutions from a series of image catalogs
- Robust pattern matching recovers pixel scales, frame position angle, chirality and shift (up to ~ 1 deg with USNO-B1).
- « Global » solutions derived simultaneously from hundreds of exposures from different instruments
- Flexible choice in the degrees of freedom
    - Manage various survey strategies and instruments.
    - Handle simultaneously several instruments (or filters) and sky areas
    - Special mode for MEGACAM to fix the jittering CCD positions derived by CFHT
- Processing time is about 15s/MEGACAM exposure
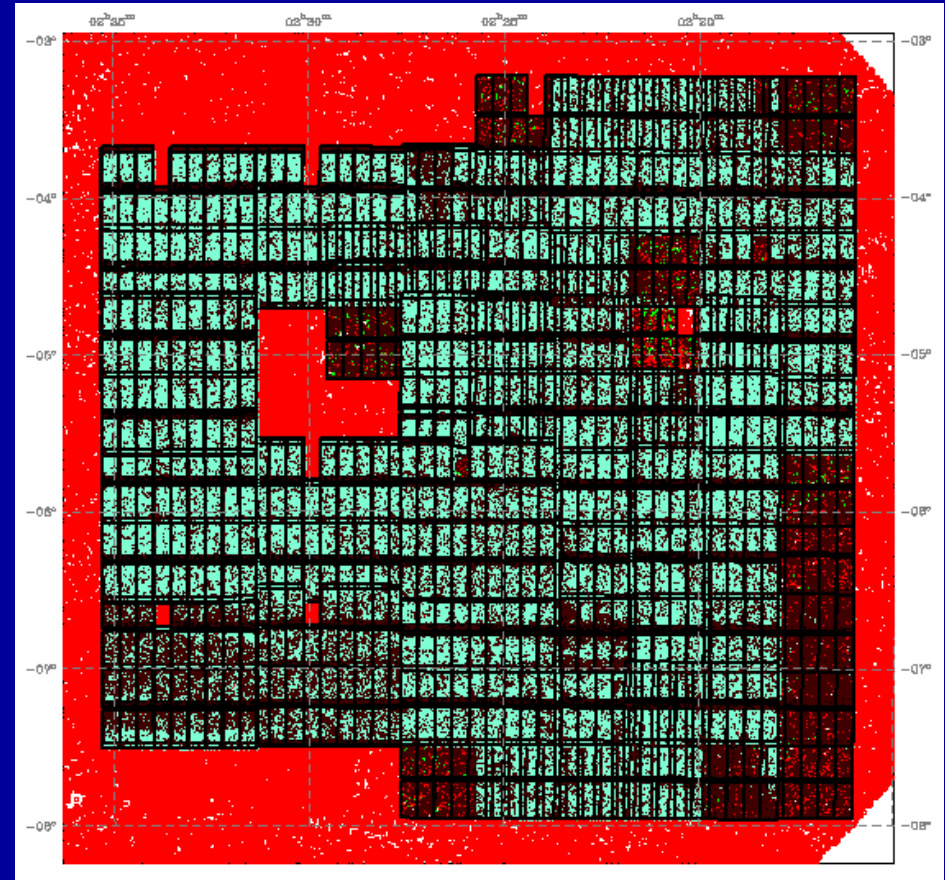
Next releases:
Petrosian magnitudes in SExtractor:
accuracy measured on a simulated galaxy field
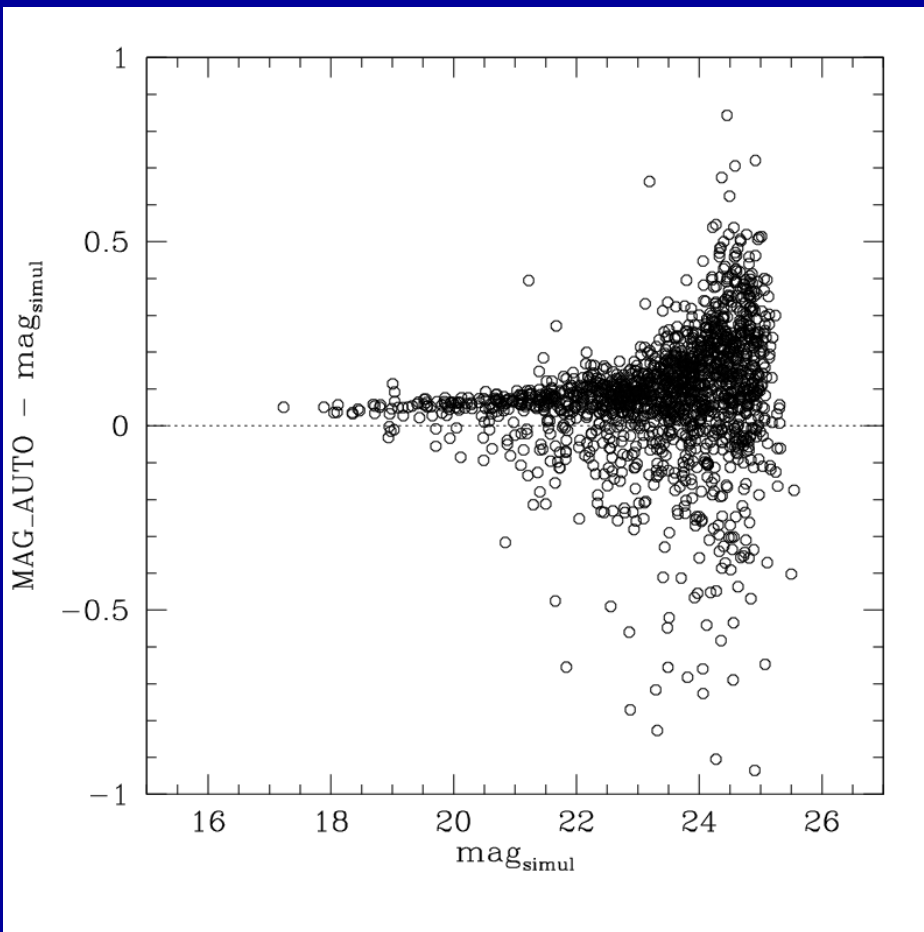
↑ MAG_AUTO:
Δm 🕐 0.06
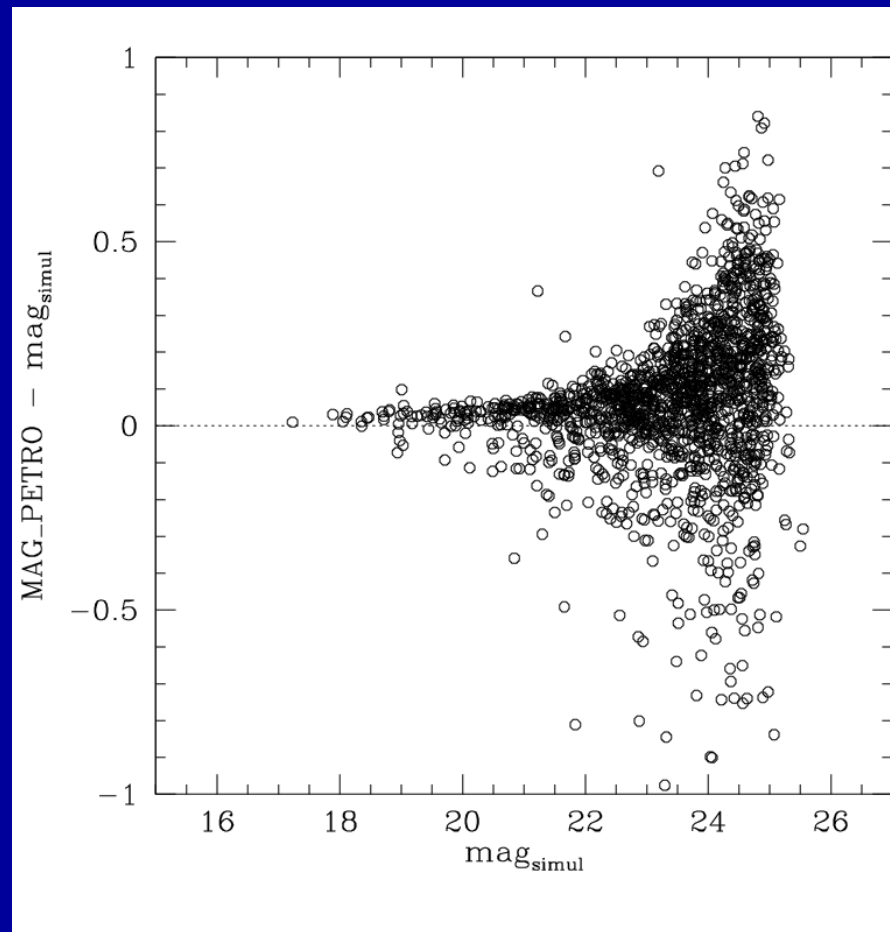
↑ MAG_PETRO:
Δm 🕐 0.03

Current software developments: identifying large image defects

- **Defectix**: Automatic identification of large image artifacts (**A. Baillard**)
  - Pattern recognition with machine learning (unsupervised+supervised)
  - Trained with simulated and real data superimposed to sky images
    - Bright star halos
    - Diffraction spikes
    - Satellite trails
    - "Comet tails"
    - Residual fringe patterns
  - <5 minutes per MEGACAM exposure (*vs* 5 hours by hand)