Pan-STARRS Status
Pan-STARRS
PS1 Science Consortium
Nigel Metcalfe – January 2012

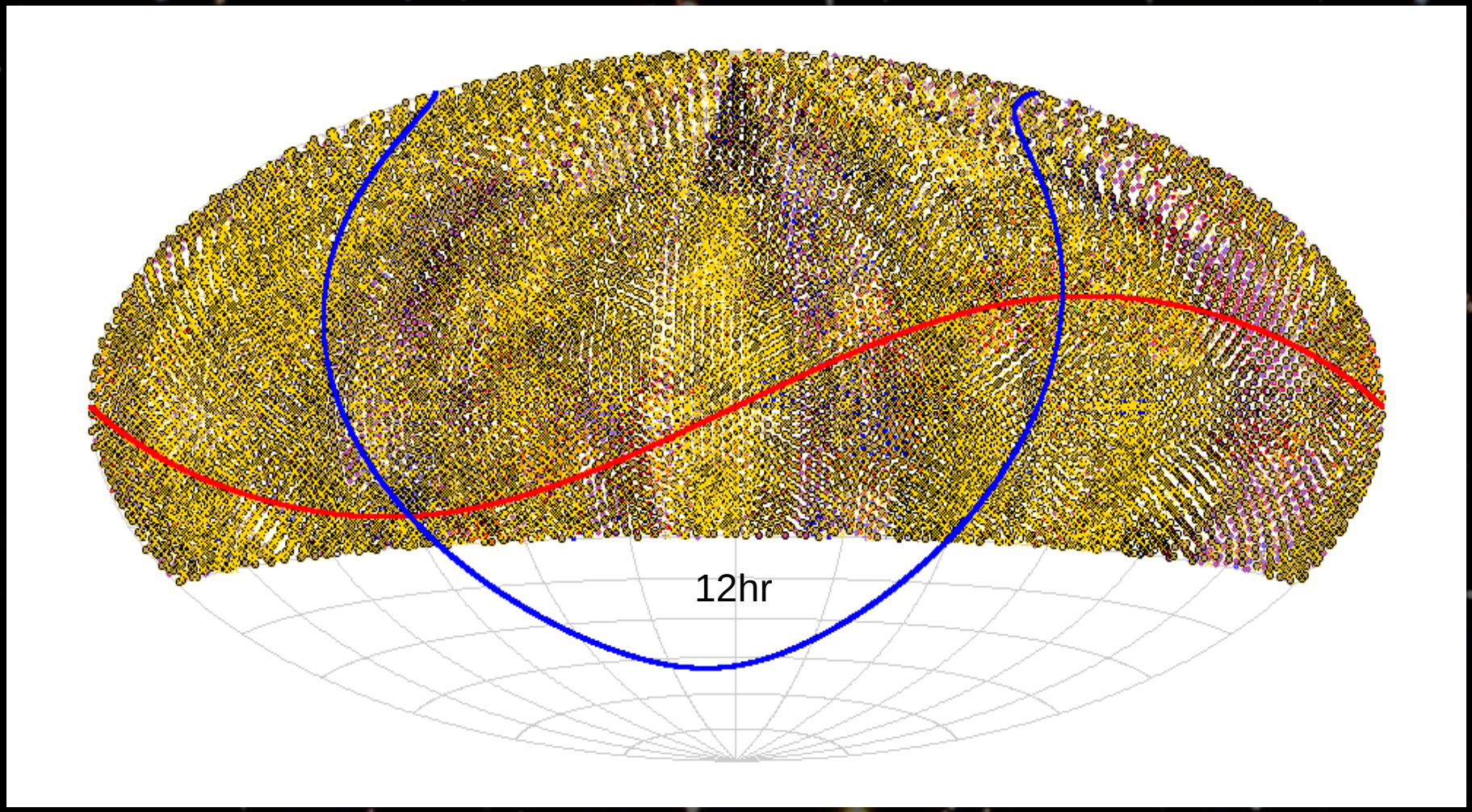
3-pi Survey

- Whole sky down to -30deg dec. Three year aim is for 12 exposures per pointing (6 pairs).

- g - 43sec, r- 40sec, i – 45sec, z & y 30sec
- Now have at least 1 epoch's worth (1 pair) of coverage in all bands.

- Modal FWHM: g - 1.18", r -1.03", i - 1.02", z - 0.94", y - 0.90"

3pi coverage to Jan 1, 2012



grizy bands - more than 33 epochs on average, or >~ 6 per filter

SAS2 test area

- 64 sq. degs to full 3 year depth in all bands
- Overlaps with SDSS DR8 and Stripe 82
- Encompasses PS1 Medium Deep 09
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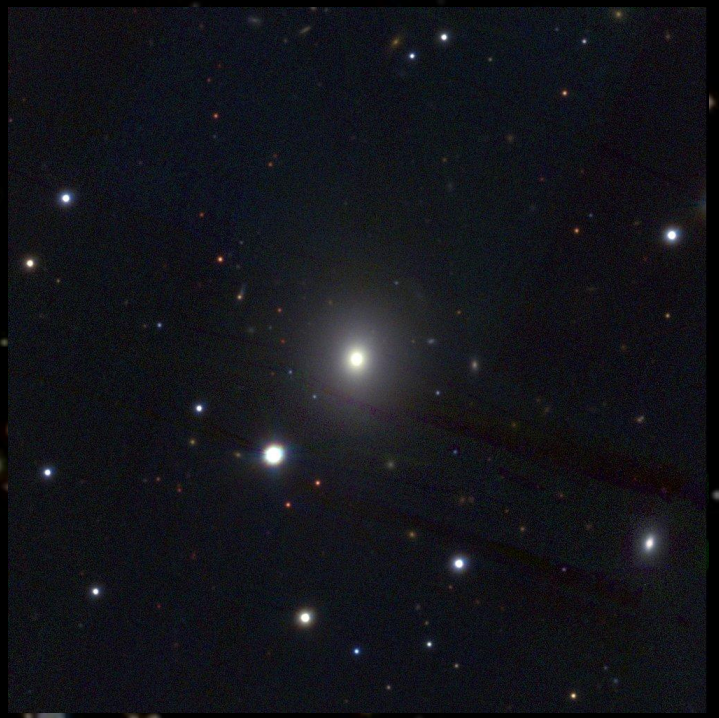
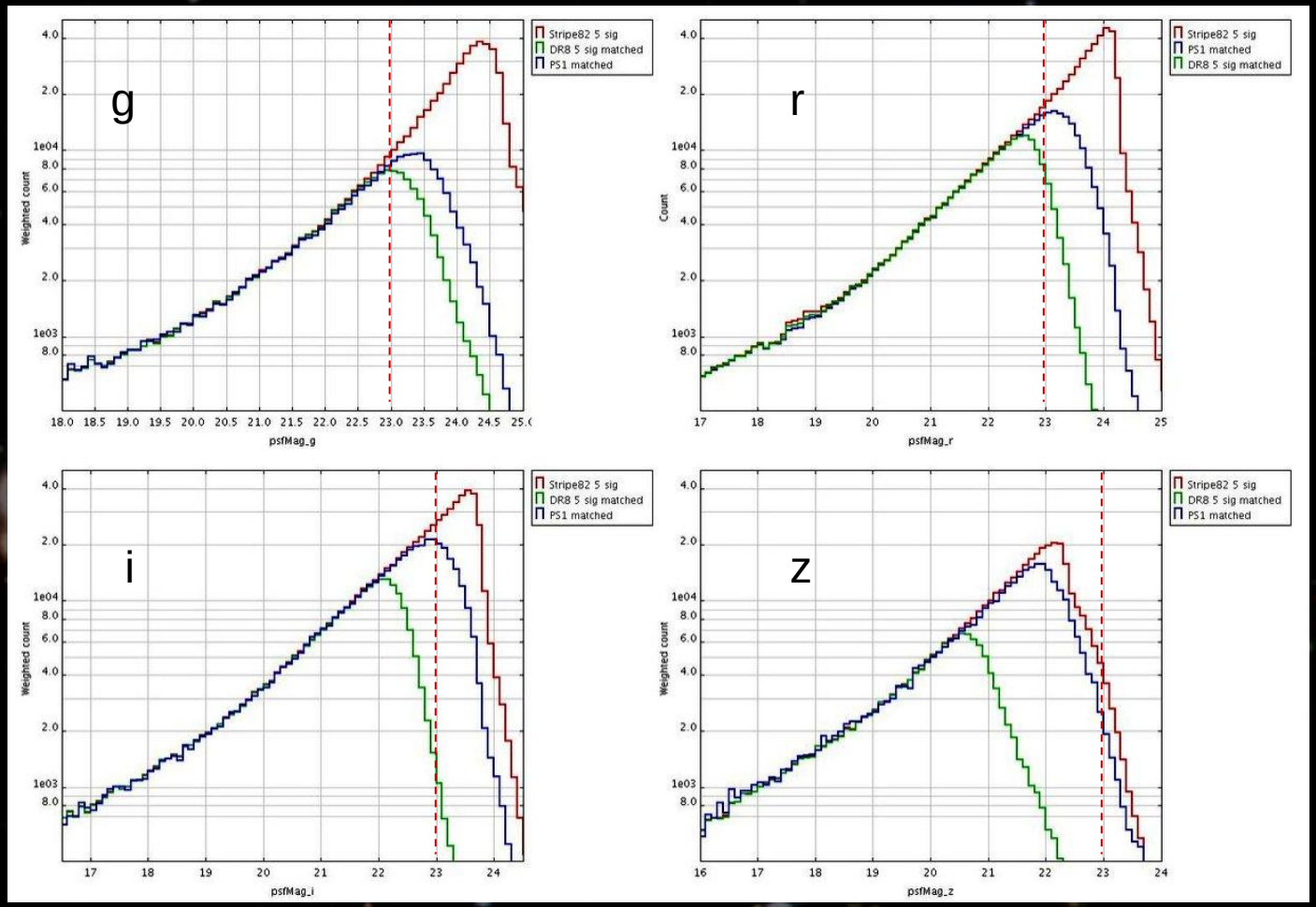
- 22hr < RA < 22h32m
- -4 deg < Dec < +4 deg



Depth of SAS2 (3pi)

PS1 (blue) and DR8 (green) counts matched to Stripe82 (red)



Dashed line is a PSF mag of 23

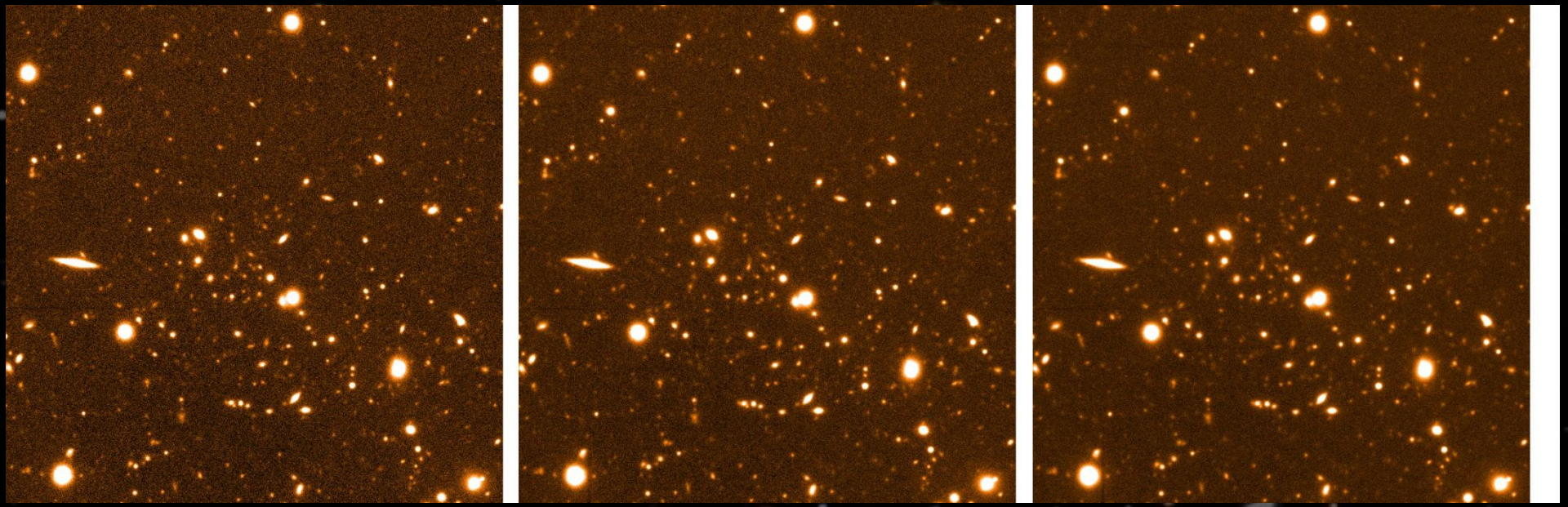
Medium Deep Fields

- 10 single fields observed 8x nightly when visible (4 days to cycle round the 5 colours).
- g, r – 113sec, i, z, y – 240sec.
- Refstacks have ~100 exposures (up to 400 exposures per band per field).
- Current status at

http://svn.panstarrs.ifa.hawaii.edu/trac/ipp/wiki/MD.GR0

Example Medium Deep

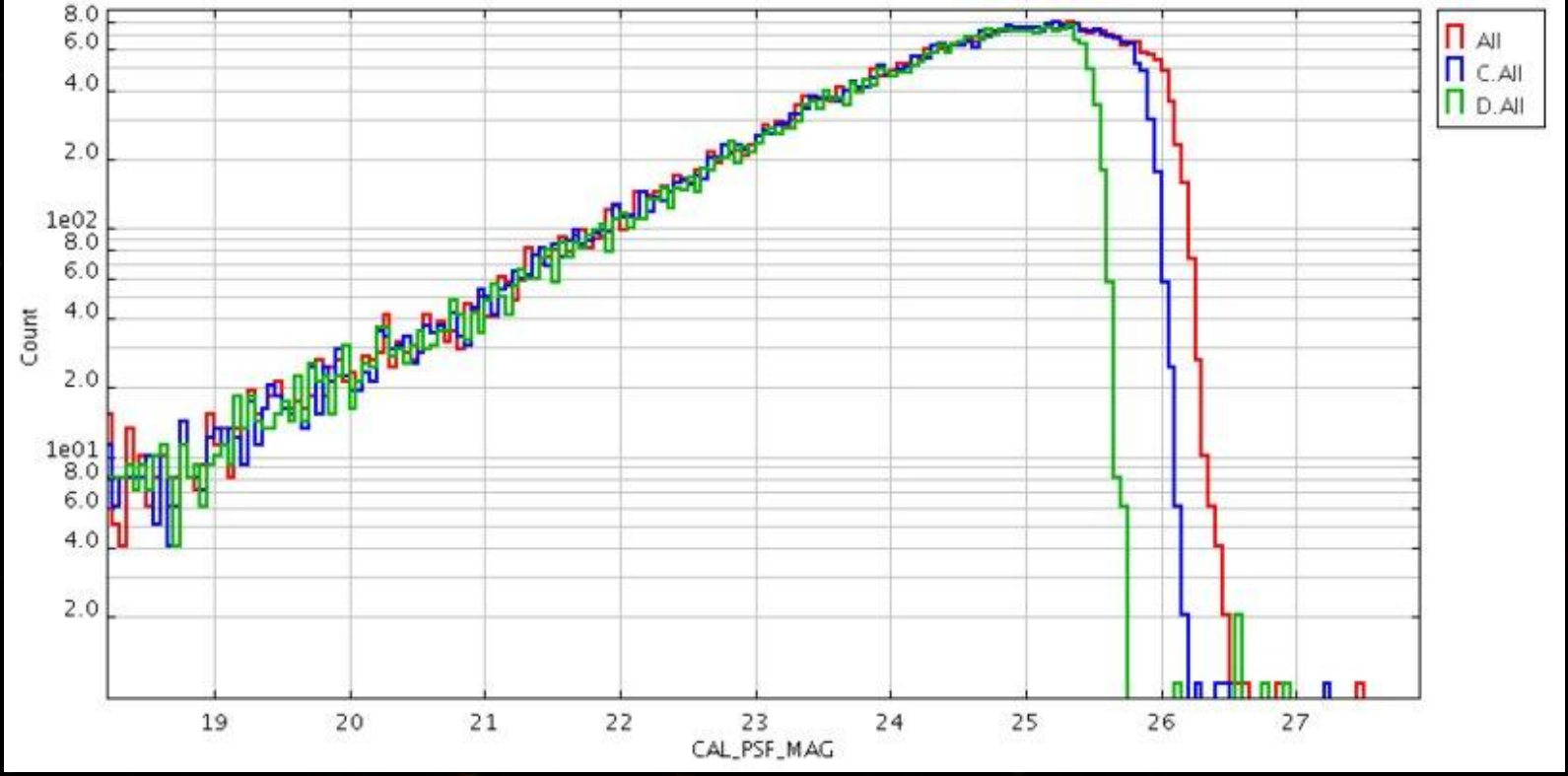
MD04 i-band skycell 055



Left - 92 warps; Centre - 206 warps; Right - 306 warps

Medium deeps

Depth of MD04 i-band skycell 055



Red - 306 warps; Blue - 206 warps; Green - 92 warps

Image data products

- Chip - single exposure, de-trended (0.26” pixels), arbitrary rotation.
- Warp – composed of adjacent chips mapped and re-sampled to standard tessellation on the sky (22 arcmin skycell, 0.25 arcsec pixels).
- Stack – combination of warps on the same skycell.

SAS2 example stacks

The effect of stacking

Catalogue products

- CAL_PSF_MAG – psf fitted magnitude currently calibrated to synthetic mags from 2mass*.
- AP_MAG profiles – aperture magnitudes in assorted concentric radii (stacks only).
- KRON_FLUX – kron flux, instrumental, no deblending.
- Extended source fits to brighter galaxies (stacks only, not tested)

* Recalibration in a month or so – as good or better than SDSS

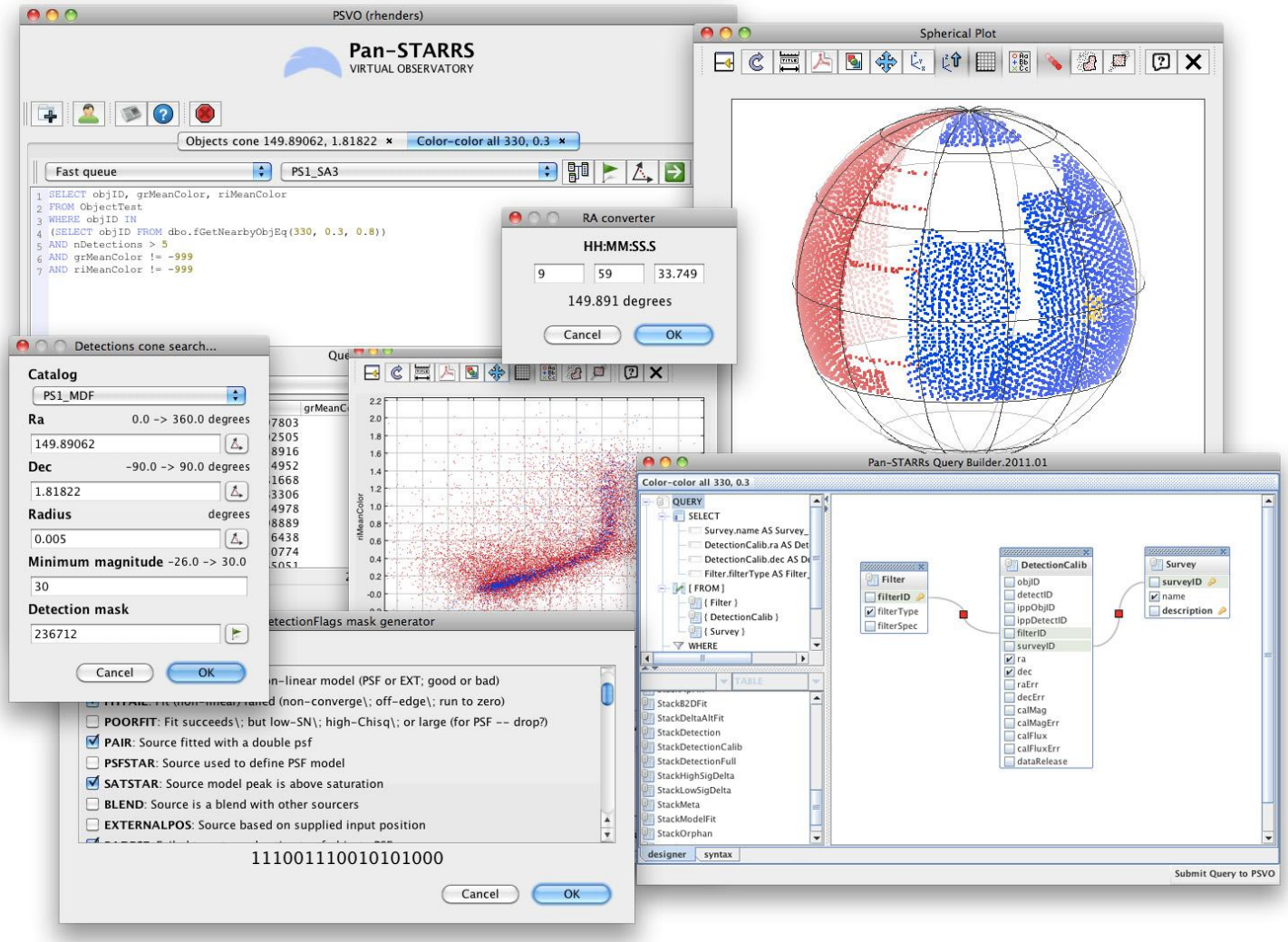
Data access

- Images, weight maps etc available for download from Hawaii via the postage stamp server (as chips, warps or stacks – up to skycell sized areas - plus associated catalogues – all FITS)

- DVO database – ingest of all catalogues, temporary measure. We have a copy in Durham.

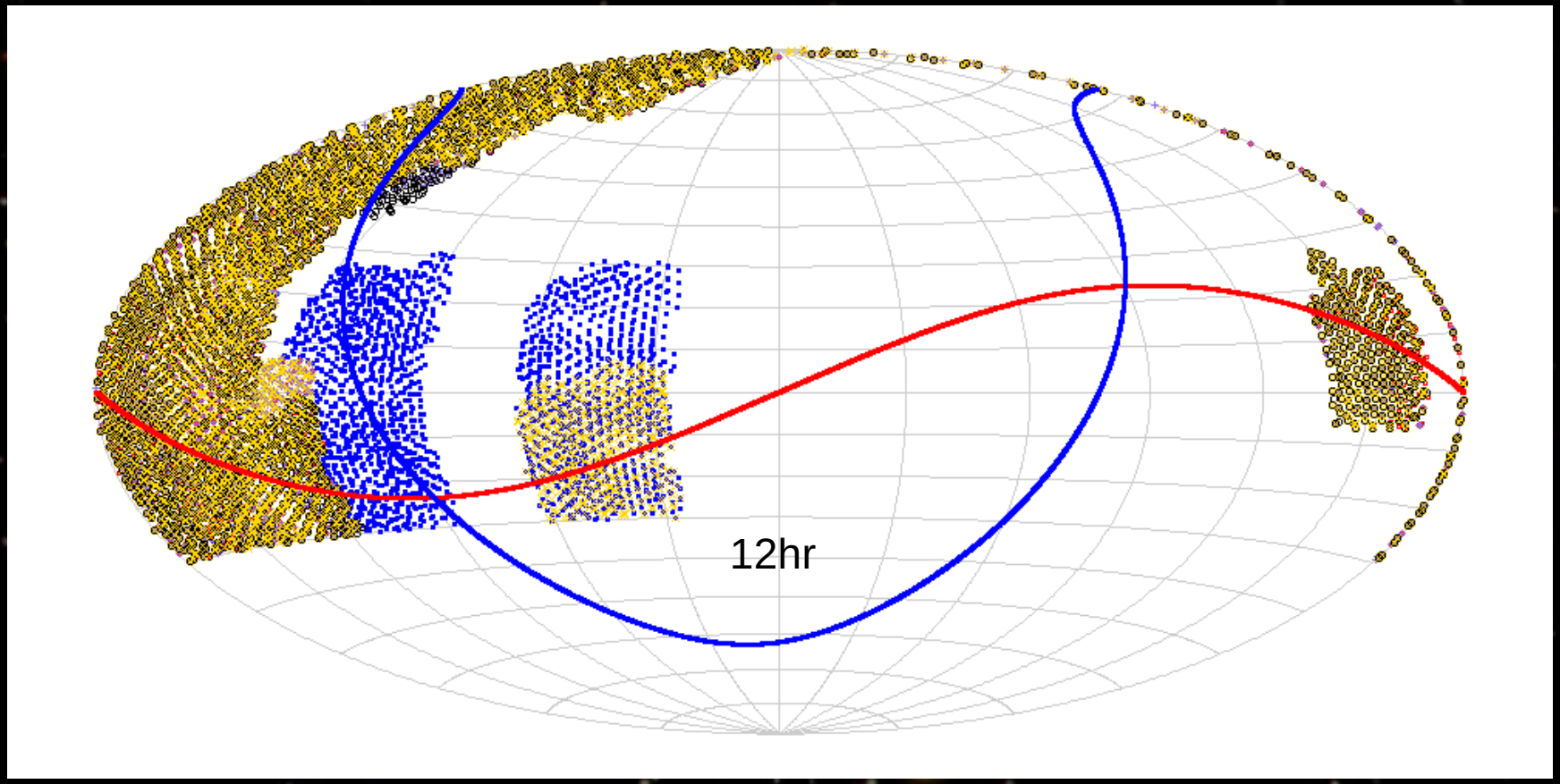
- PSPS database – this will be the ultimate catalogue interface for Pan-STARRS. Has a java V0 tool to simplify access, or can go in directly. Not all data in there yet.

PSVO


PSVO (rhenders)
Pan-STARRS
VIRTUAL OBSERVATORY
Objects cone 149.89062, 1.81822
Color-color all 330, 0.3
Fast queue
PS1_SA3
SELECT objID, grMeanColor, riMeanColor
FROM ObjectTest
WHERE objID IN
(SELECT objID FROM dbo.fGetNearbyObjEq(330, 0.3, 0.8))
AND nDetections > 5
AND grMeanColor != -999
AND riMeanColor != -999
Spherical Plot
RA converter
HH:MM:SS.S
9
59
33.749
149.891 degrees
Cancel
OK
Detections cone search...
Catalog
PS1_MDF
Ra
0.0 -> 360.0 degrees
149.89062
Dec
-90.0 -> 90.0 degrees
1.81822
Radius
degrees
0.005
Minimum magnitude -26.0 -> 30.0
30
Detection mask
236712
Cancel
OK
DetectionFlags mask generator
POORFIT: Fit succeeds\; but low-SN\; high-Chisq\; or large (for PSF -- drop?)
PAIR: Source fitted with a double psf
PSFSTAR: Source used to define PSF model
SATSTAR: Source model peak is above saturation
BLEND: Source is a blend with other sourcers
EXTERNALPOS: Source based on supplied input position
111001110010101000
Cancel
OK
Pan-STARRs Query Builder.2011.01
Color-color all 330, 0.3
QUERY
SELECT
FROM
WHERE
Filter
DetectionCalib
Survey
designer
syntax
Submit Query to PSVO

Current PSPS 3-pi

Other surveys may be available ...



gpc1 interrogator

http://astro.dur.ac.uk/pandata.php

Pan_STARRS gpc1 database interrogator

** Most recent exposure in database is 2011-01-25 08:19:23 **

A few stacks in the datbase have the wrong datagroup and hence show up in the wrong place.
You can check the comment field to see if it is consistent, or the tess_id if you are looking at the details of an individual stack.

We also have a page where you can calibrate a cmf file against SDSS. You might also like to take a look at the Pittsburgh Stamp Requests page.

Options:

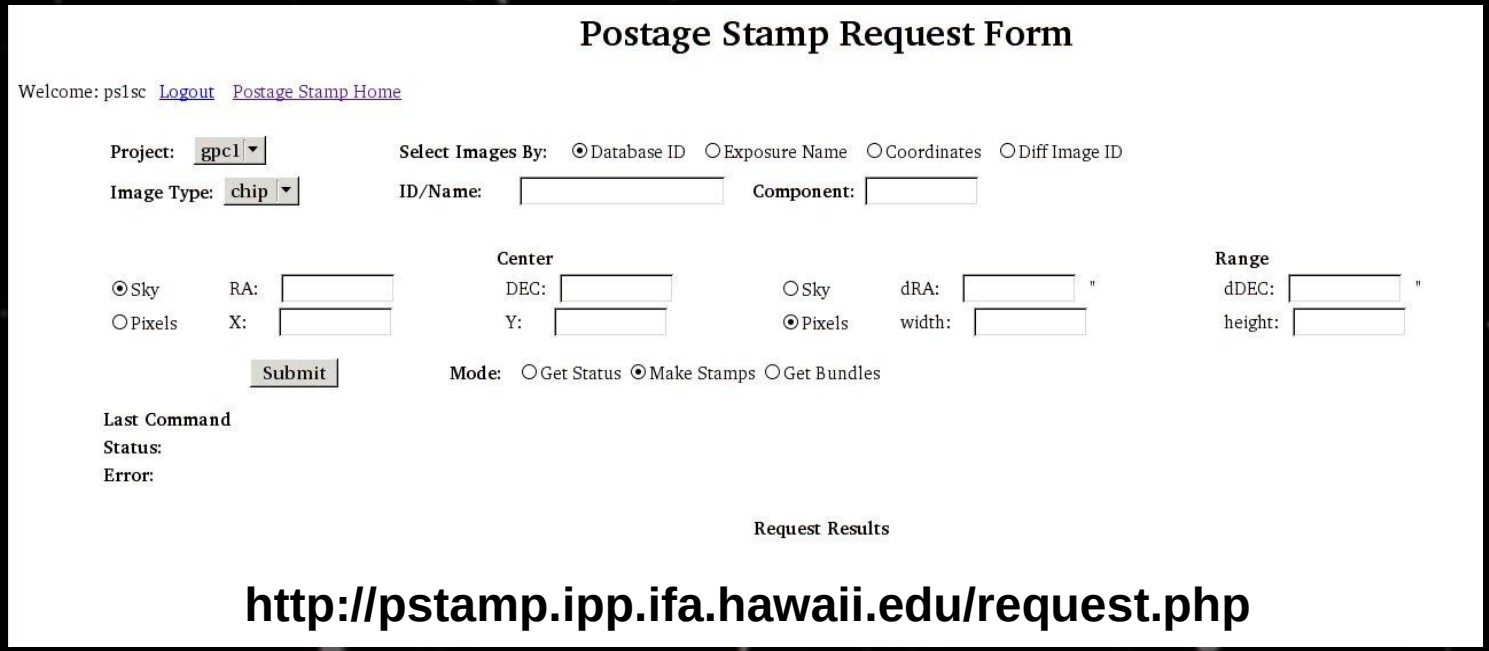
Note: each skycell has a separate stack, and there are about 100 skycells per Medium Deep field. So you can potentially get a lot of stacks back unless you restrict by skycell. As a result there is a limit to the number entries the queries will return. However, there is only one warp per exposure (i.e. a warp includes all skycells for that field).

- MD01 | Any filter | All skycells | => | List latest stacks
- MD01 | Any filter | => | List latest warps | or | List latest magicked warps
- Stack id: | Details of this stack
- Warp id: | Details of this warp | *(including constituent skycells)*
- Warp name: | Details of this warp
- List stacked skycells | by filter | Any filter | with centres within a | 0.25 | deg radius of
  RA: 00 h 00 m 00 s . 0 Dec: +/-: + 00 ° 00 ' 00 " or a named object:
- List warps | (or | List magicked warps |) by filter | Any filter | with centres within a | 0.25 | deg radius of
  RA: 00 h 00 m 00 s . 0 Dec: +/-: + 00 ° 00 ' 00 " or a named object: (Remember, the warp coordinate is the telescope pointing position)
- List chips | by filter | Any filter | with centres within a | 0.25 | deg radius of
  RA: 00 h 00 m 00 s . 0 Dec: +/-: + 00 ° 00 ' 00 " or a named object: (Remember, the chip coordinate is the telescope pointing position)

Postage stamp server

Peter Draper's tools:

- pssgetchips -s SIZE –r FILTER <ra> <dec>
- pssgetobj –s SIZE –r FILTER -t TYPE <objectname>
- pssgetposition - s SIZE -r FILTER -y TYPE <ra> <dec>



These return fits files of the image, the weight map and the mask.

Durham Products

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- All Medium Deep nightly stacks (x8) are downloaded from Hawaii as gzipped tarballs.

- We have the latest overall stacked (refstacks) Medium Deep fields. Some locally produced catalogues (psphot and Sextractor)

- SAS2 (Small Area Survey 2 – 3pi 3 year demo, 64 sq.deg.), again images and locally produced catalogues.

Outstanding Issues

- Calibration – currently fairly rubbish (i.e. only accurate to a few tenths of a mag). Ubercal should fix this.
- Background structure issues. Still being worked on. Limits the ability to work at low s/n. More of a problem on the 3pi.
- False positives in the catalogues, particularly an issue with Kron mags. Mostly in the wings of brighter objects.