



DARK ENERGY
SURVEY

DES Y3A1 release and Connection to BLISS

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(thanks to Robert Gruendl and the DESDM)
March 27, 2017
BLISS Meeting



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BLISS notes

BLISS will initially work with single epoch catalogs from images loaded into a postgres database. This typically has detection limits of about 23rd magnitude in gri.

Photometric Calibration is expCalib.py from Sahar/Douglas against APASS/2MASS (initially ~2% rms errors in g,r,i,z)

Astrometric Calibration is against Gaia (rms positions to <40 mas typically)

Data will be available in FITS catalogs and then in POSTGRES database at FNAL for data not available from DESDM.

Should discuss ways to make coadds, get catalog level coadds, etc.



Y3A1 Release Processing

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FINALCUT (single-epoch) complete!

- 71,000 exposures from Y3, Y2, Y1, and much of SV

First COADD campaign (Y1+Y2+Y3)

- 10,346 tiles complete!

Main Y3A1 Data Release to Collaboration – December 2016

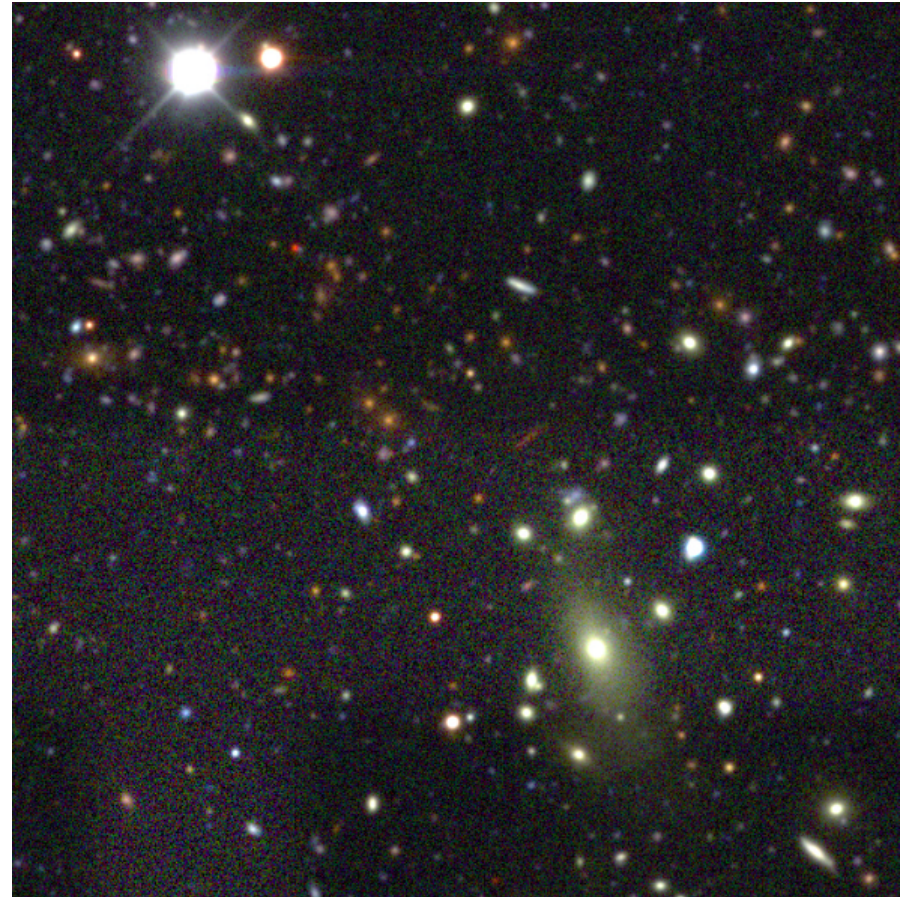
Still to come:

- COADD_DEEP campaign underway (830/859 tiles done, includes u-band tiles and tiles of SN exposures shallow depth NEPOCHS~30, deep depth ?
 - SN fields will only use best seeing observations (~70-80% of possible depth)
- Afterburner MOF and NGMIX processing campaign underway – excellent MOF magnitudes and shears for all Y3A1 objects (will take 2 months to finish).
- Y3A2 (this is a version of Y3A1 spinning in a new, faster DB+fixes to MANGLE and other bugs found in Y3A1. Expected ahead of June 2017.



Sample gri

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03/06/17

NEPOCHS=4
NEPOCHS=16

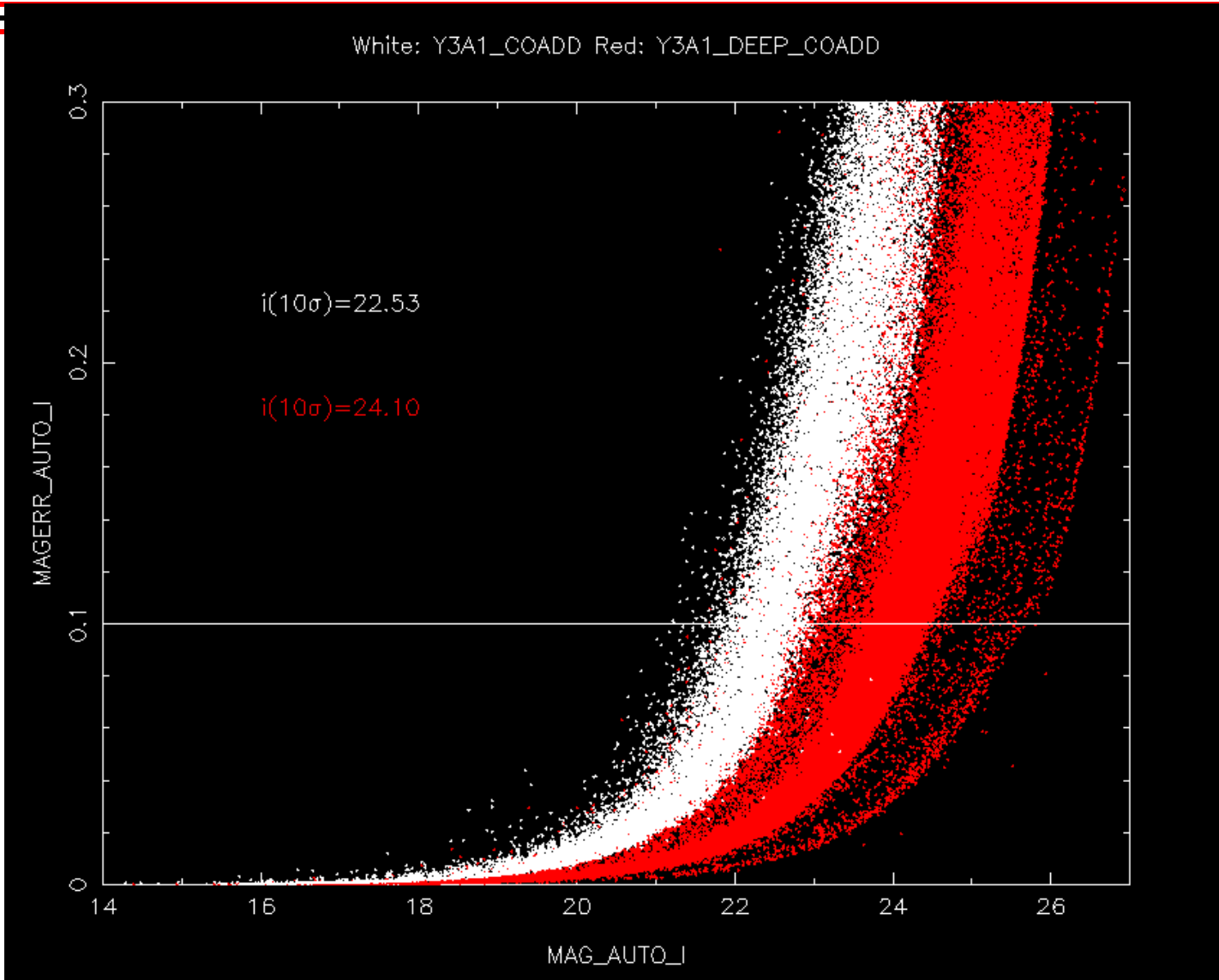


DES0222-0541

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White: Y3A1_COADD Red: Y3A1_DEEP_COADD

Y3A1
vs.
DEE
P

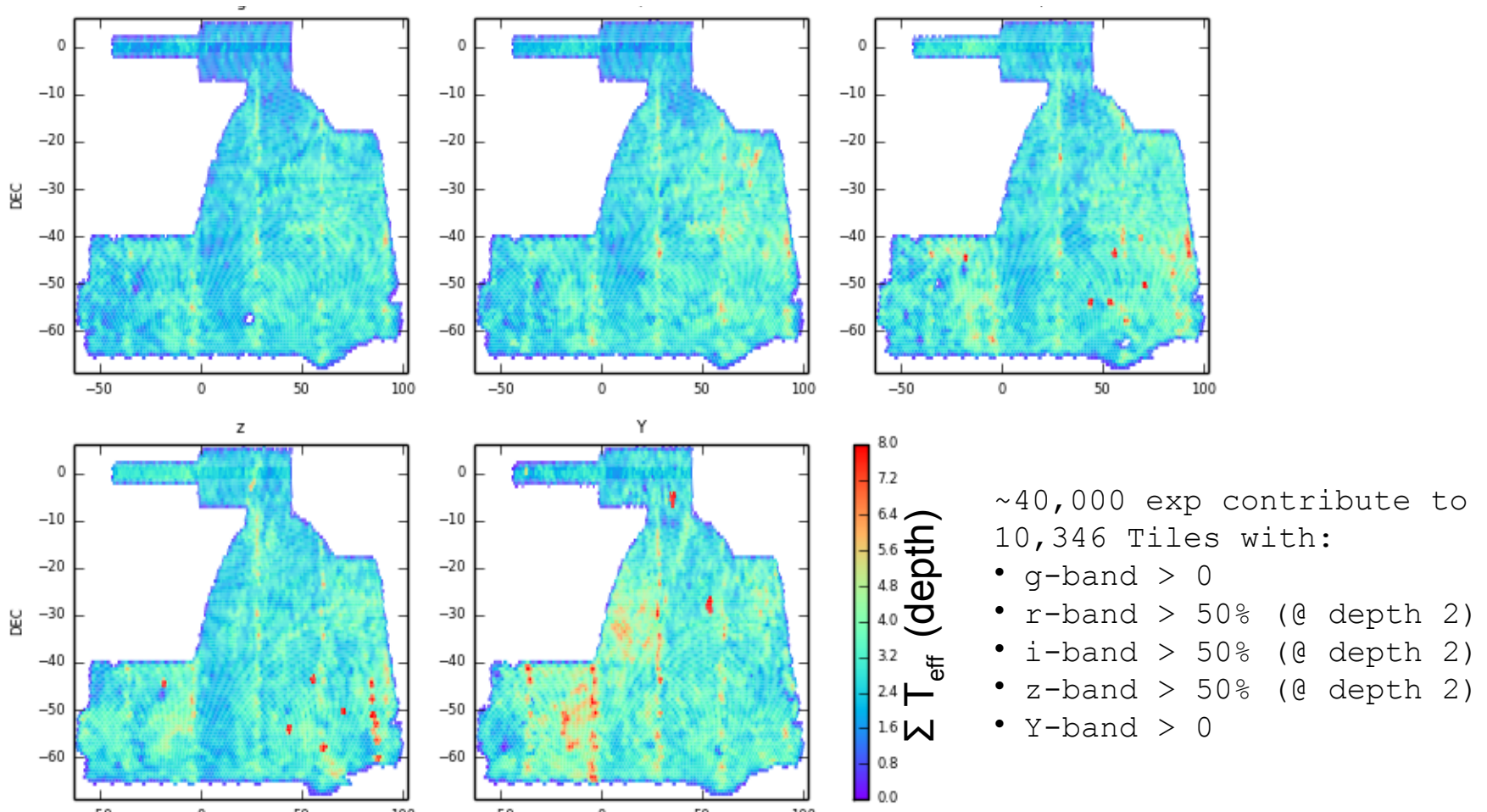


03/06/17



Y3A1 COADD Footprint (Y1+Y2+Y3)

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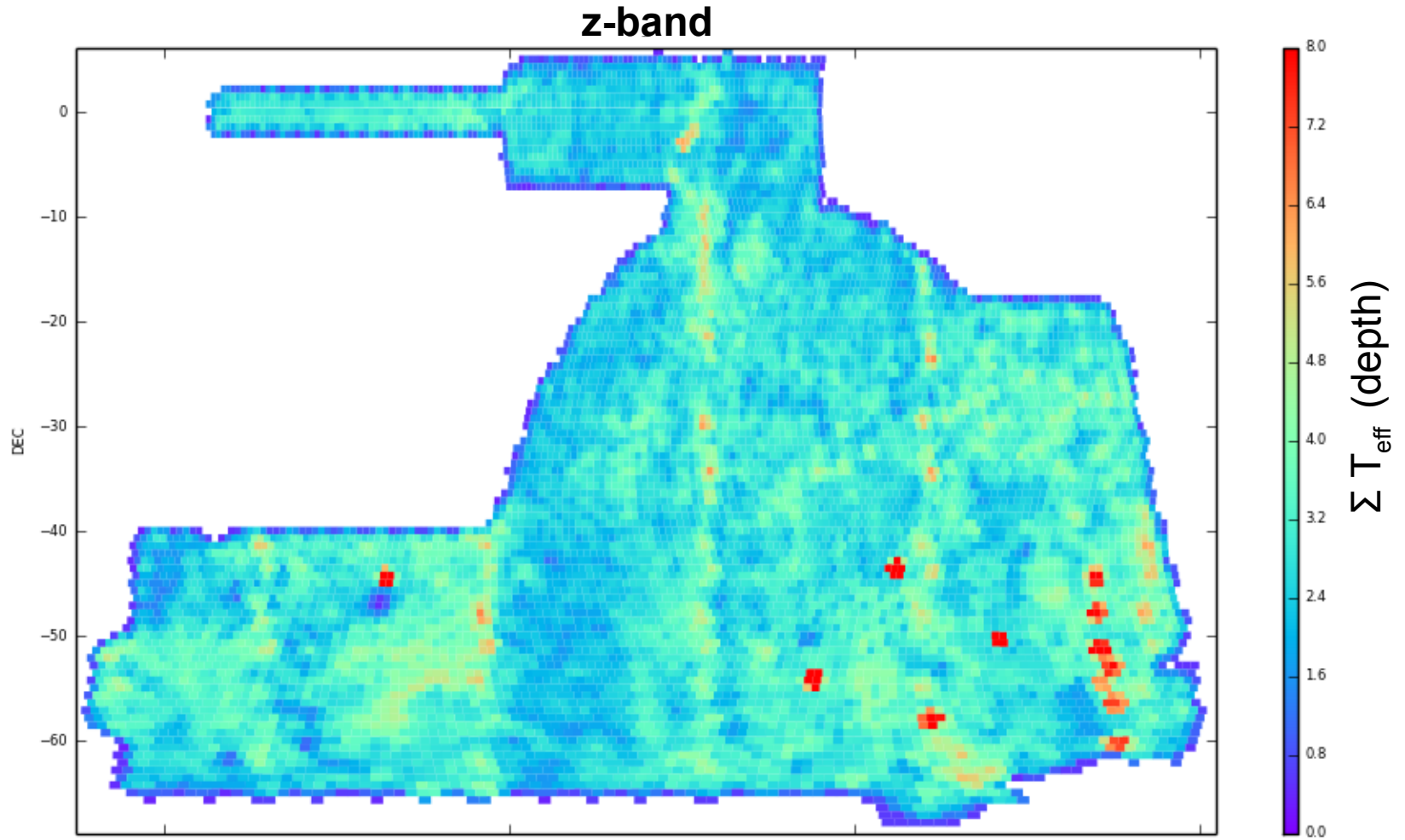


03/06/17



Y3A1 COADD Footprint (Y1+Y2+Y3)

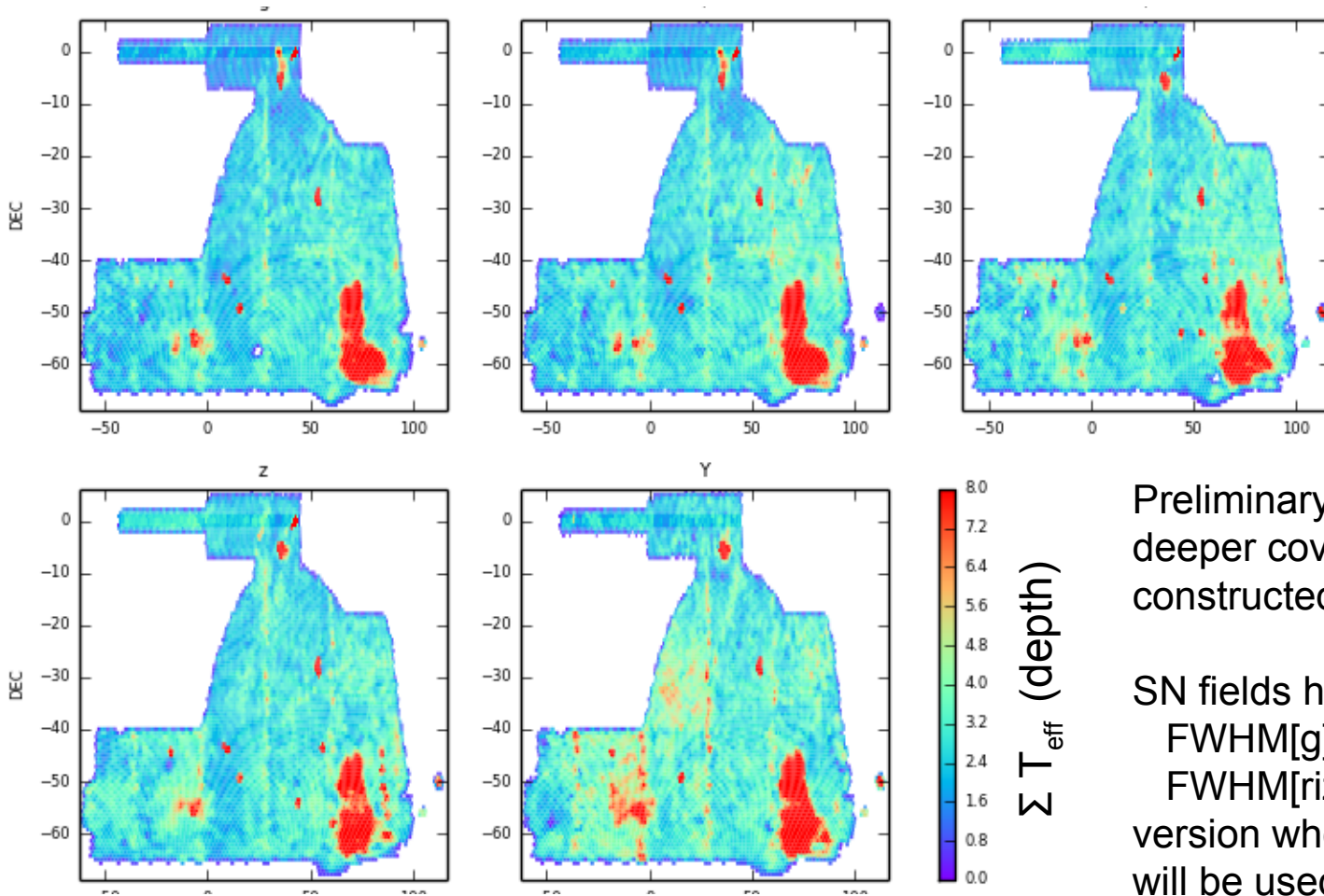
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Y3A1 COADD Footprint (DEEP)

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Preliminary: O(1000) tiles w/
deeper coverage to be
constructed in a 2nd campaign.

SN fields have special cuts:
FWHM[g]<1.1"
FWHM[riz]<1.0"
version where all DES data
will be used in their generation.



Y3A1 Release

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Single Epoch: 5.6 billion objects

Multi-Epoch (coadd): 400 million objects

Main and Supporting Tables (all have table_name like 'Y3A1%')

Table	Content
Y3A1_FINALCUT_OBJECT	All single-epoch object measurements
Y3A1_FINALCUT_OBJECT_HPIX	HPIX (nsides=16384) for objects
Y3A1_COADD_OBJECT_SUMMARY	Selected measurements for COADD objects (grizY quantities)
Y3A1_COADD_OBJECT_{band}	All other measured quantities for each COADD object (one band per table)
Y3A1_WAVG_OCLINK	Links COADD objects to SE objects
Y3A1_PROCTAG	Tagged groups of processing attempts
Y3A1_IMAGE	Image and image metadata
Y3A1_CATALOG	Catalog and catalog metadata
Y3A1_MISCFILE	Miscellaneous products and metadata
Y3A1_FILE_ARCHIVE_INFO	Path information to retrieve products from the storage condominium
Y3A1_QA_SUMMARY	Summary of QA from FINALCUT processing (per exposure)

DETAILED RELEASE NOTES:

<https://opensource.ncsa.illinois.edu/confluence/display/DESDM/Y3A1+Release+Notes>



Y3A1 Reprocessing

Improvements to be aware of when working with Y3A1 Image and Catalog products

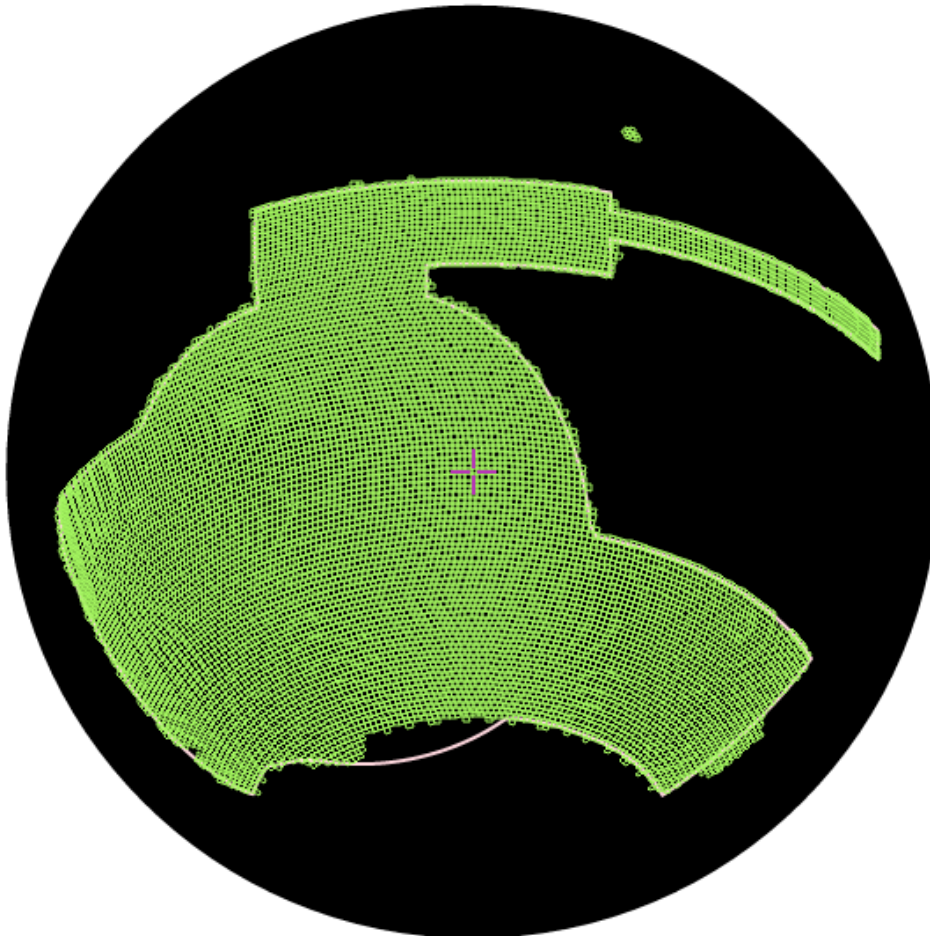
- Reduced image units are ELECTRONS (previously ADU)
- Brighter-Fatter Correction has been applied
- Full Focal Plane sky fit/subtraction has occurred
- Mask (MSK) plane propagates to catalogs (IMAFLAGS_ISO)
- Weight (WGT) plane in archive preserve weights.
 - do not reflect flags (i.e. bad pixels do not have zero weight).
 - When performing off-line analysis, users may need to also consider mask data.



Highlights of the Y3A1 release

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<https://opensource.ncsa.illinois.edu/confluence/display/DESDM/Y3A1+Release+Note>



5000 square degrees
400 million distinct objects
10 sigma point source
depth:

(preliminary)

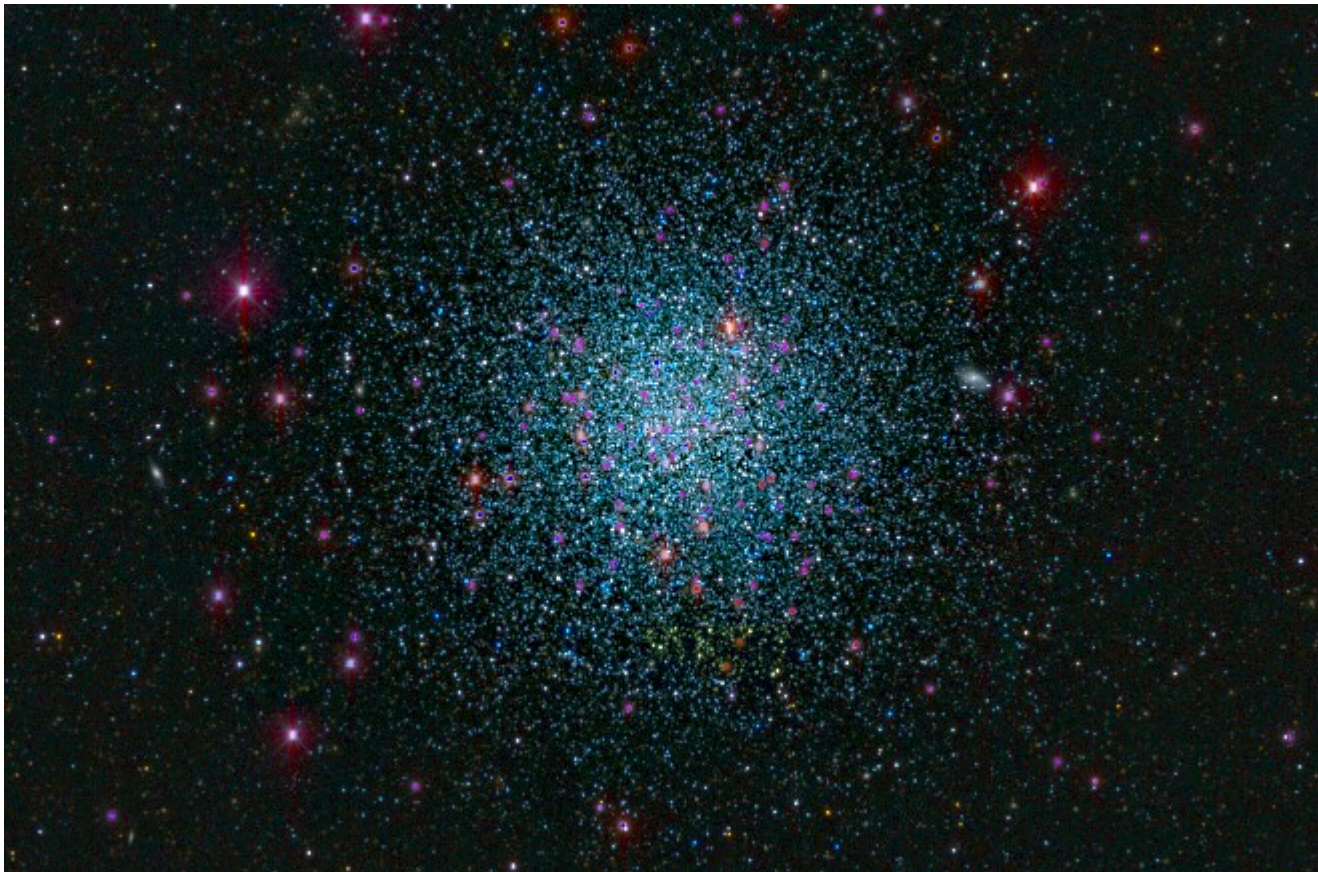
Band	Y3	(Y5 req)
g	24.3	(24.6)
r	23.9	(24.4)
i	23.4	(23.7)
z	22.7	(22.7)
Y	21.4	(21.5)



Science Portal: Y3A1_COADD Images and Catalogs

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NGC 288

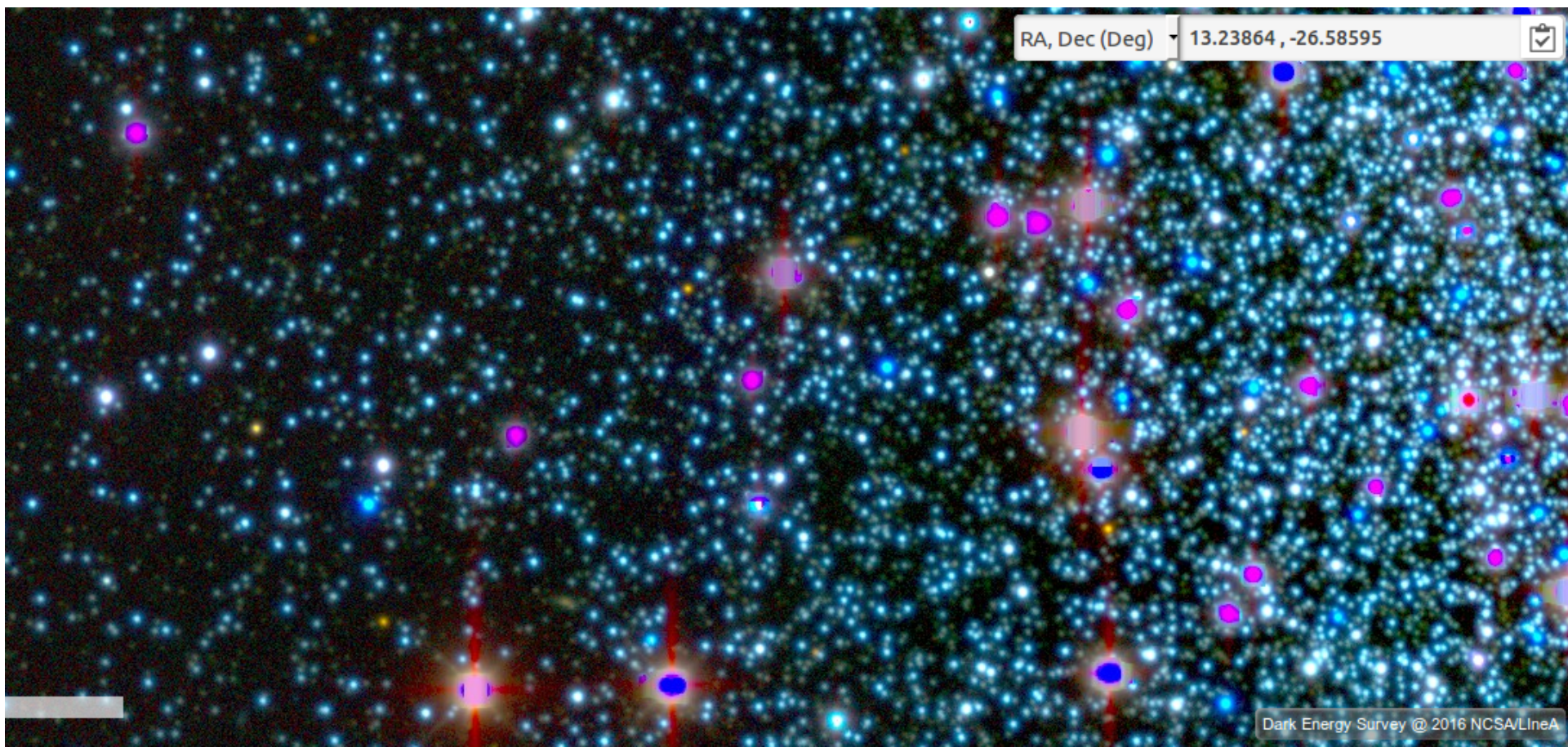




Science Portal: Y3A1_COADD Images and Catalogs

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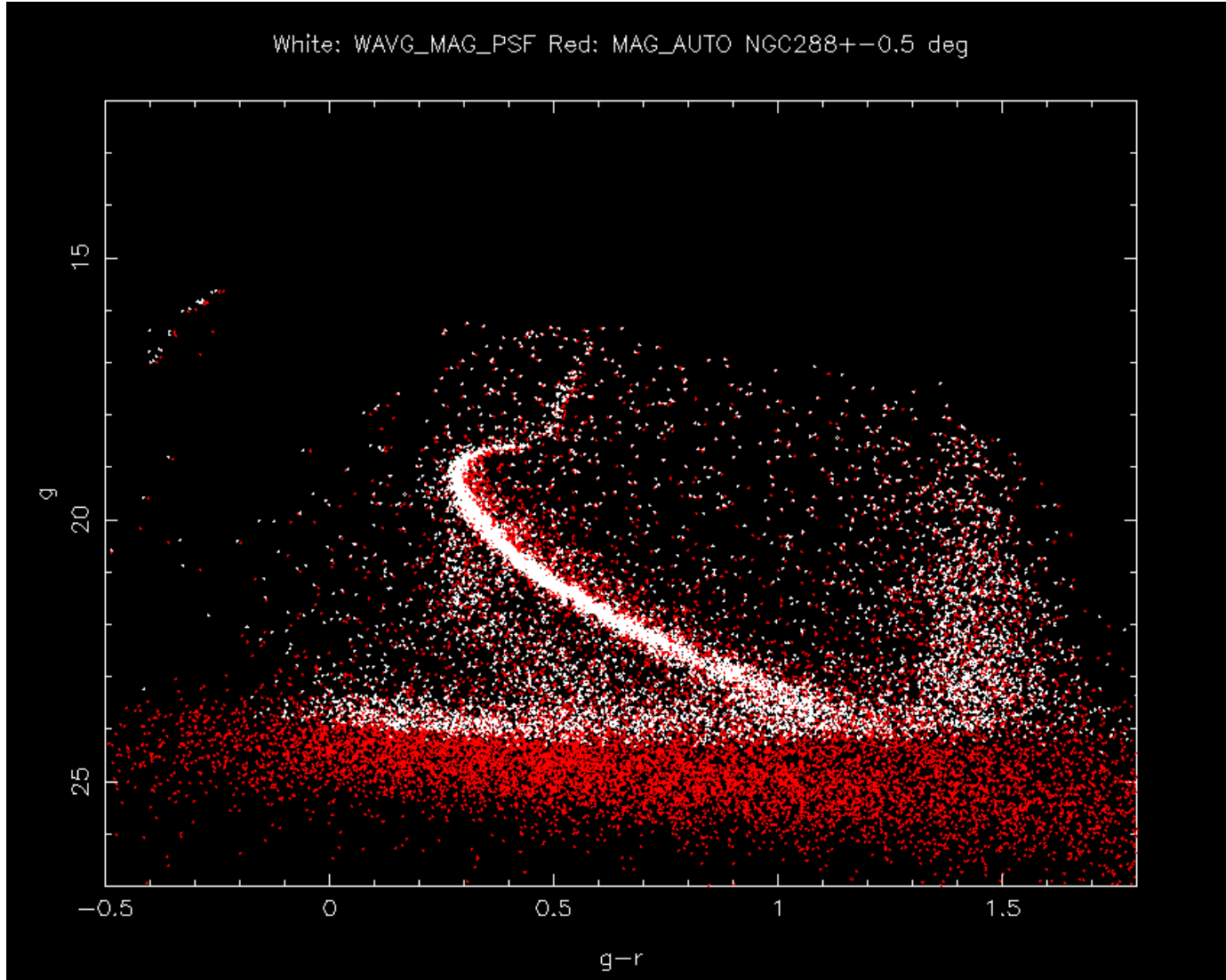
NGC 288





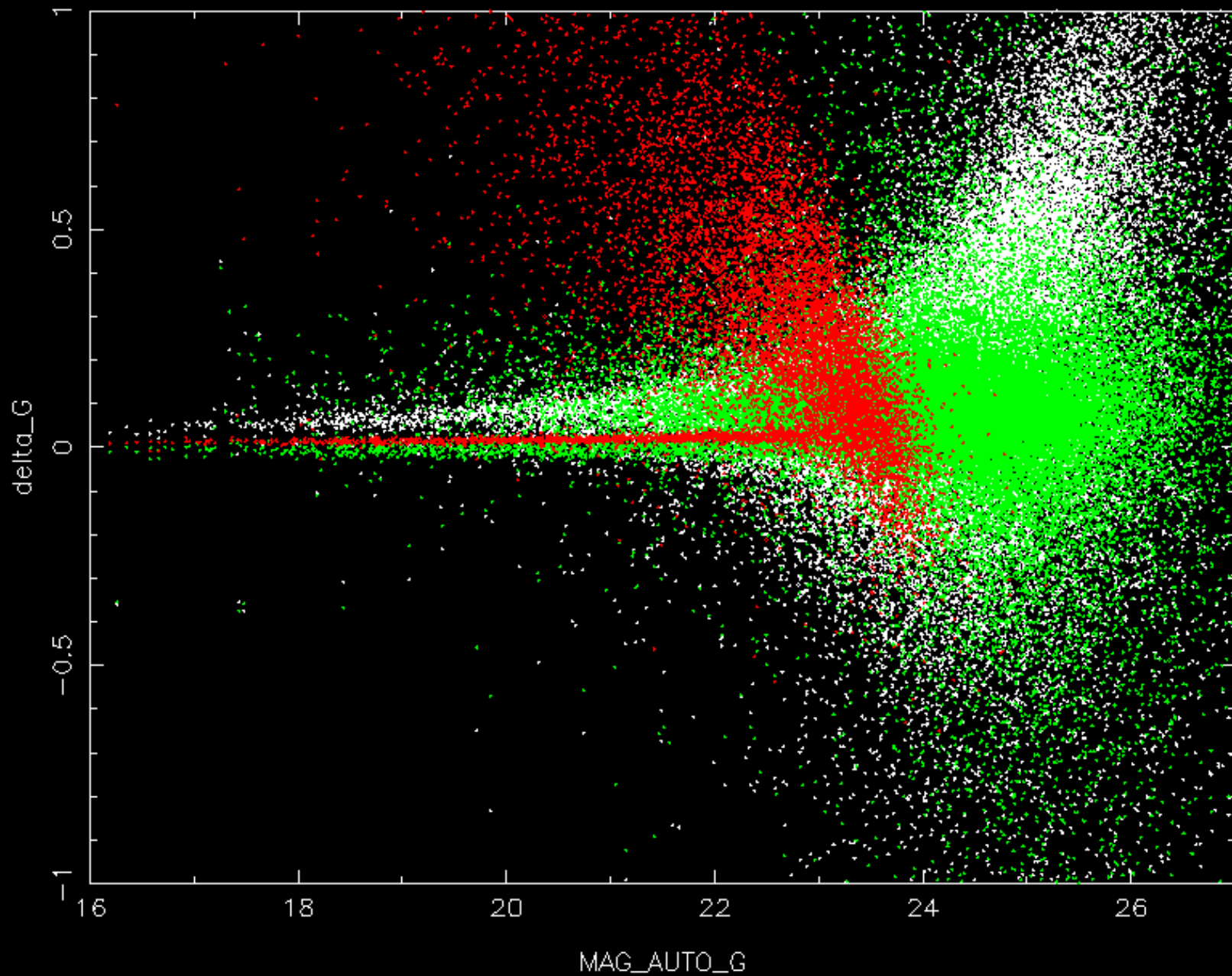
Science Portal: Y3A1_COADD Images and Catalogs

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White: AUTO-MOF Red: WAVG_PSF-MOF Green: DETMODEL-MOF

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DESDM On-Boarding & Help

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- The on-boarding procedure at DESDM has now been centralized and is triggered directly when members on-board at FNAL.
- Revamped services for account help (off the DESDM confluence page)
 - <https://deslogin.wufoo.com/forms/help-me-with-my-desdm-account/>
 - Automatic password resets
 - Account privileges, quotas, resources
 - If you have requested help and get no response please feel free to directly contact Gruendl/Carrasco-Kind/Menanteau.
- Also available through the DESDM opensource Confluence:
 - **Questions**
 - HipChat



Other Services

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- All services at NCSA currently run on VMs
 - Wiki/Confluence/JIRA moved to OpenSource w/ broad expansion in services including a StackOverflow like capability
- **New** DESDM COADD and exposure Cutout
 - descut.cosmology.illinois.edu
 - For COADD cutouts for SVA1/Y1A1 and Y3A1
 - For SEPOCH we only have Y3A1_FINALCUT
- **New** Experimental Jupyterhub services (cc matias)!
- On-going development to supply an instance of the Brazil-Portal at NCSA that will interphase directly with the DESDM database(s)
- A new initiative is underway to allow direct interaction between DESDM and NOAO DataLab with direct access to DB to aid in the DR1 public data release of DES data.



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easyaccess -s dessci : catalogs and links to fits images

For the DESDM data, can look for exposures with object like '%BLISS%'
In the DESOPER database.