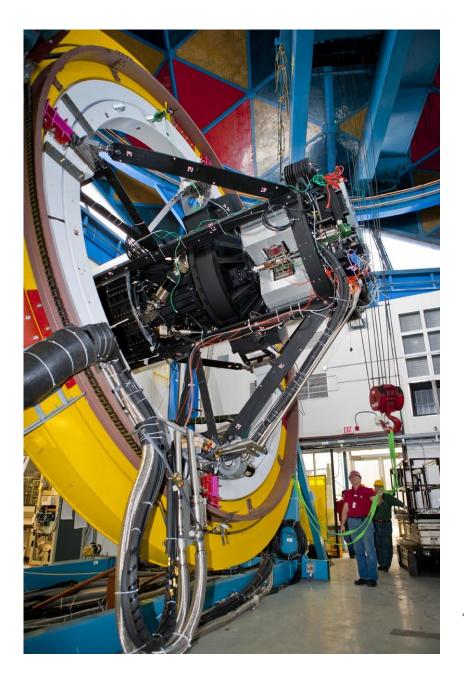
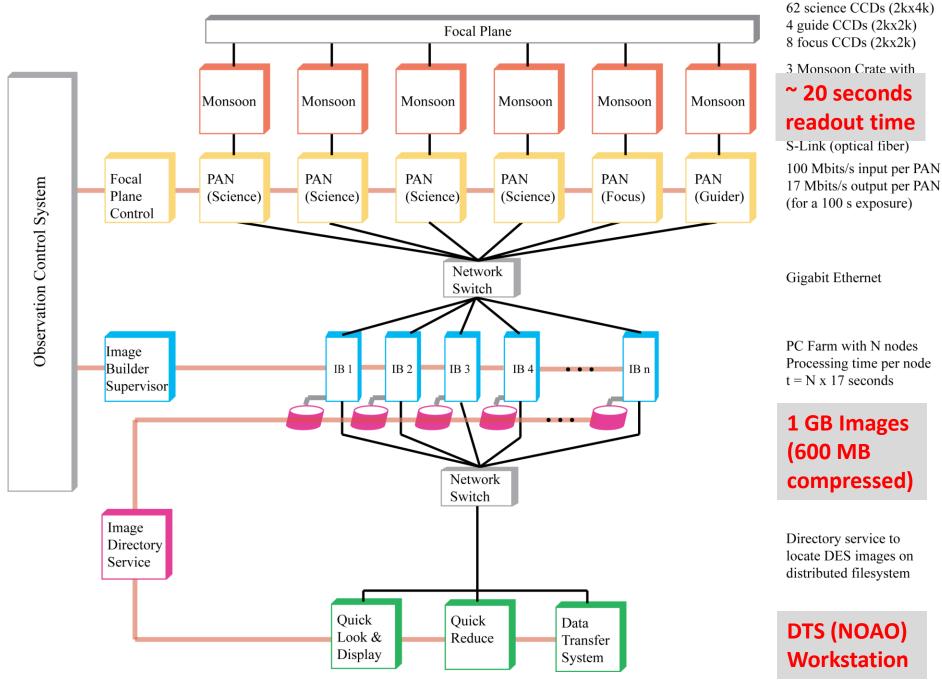
Observing with DECam

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DECam Community Workshop Tucson, August 18, 2011



DECam Observer Console

What to expect:

- Linux workstation
- DECam GUIs are webbased
- Some VNC
- 8 screens
- How-To's, Manuals, Procedures on Wiki
- Webcam with Skype: DECamObserver
- Chat
- Gmail account: decamobserver@gmail.com
- Observer workstation (4 screens)



Observation Control (OCS) and Exposure Queue

- OCS orchestrates entire exposure sequence
- 2 exposure deep pipeline
- Exposure requests are submitted to Exposure Queue
 - Manual
 - Obstac (DES)
 - Script(Script Editor)

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DECam Image Format

- Standard FITS Format
 - Multi-extensions
 - 62 4kx4k science CCDs
 - 8 2kx2k focus& alignment CCDs
 - 1 ccd = 2 amp per extension
 - 16 bits per pixel
- Tile compression

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LSKYPHOT ⁽²⁾ Logical T RASICAM local sky dear flag PV1_6 Float 0.0 PV Distortion Coefficient LSKYVAR ⁽²⁾ Float 0.21 RASICAM local sky fraction above threshold PV1_7 Float 0.00 PV Distortion Coefficient LSKYHOT ⁽²⁾ Float 0.51 RASICAM local sky fraction above threshold PV1_8 Float 0.00 PV Distortion Coefficient LSKYPOW ⁽²⁾ Float 0.52 RASICAM local sky fraction above threshold PV1_9 Float 0.00 PV Distortion Coefficient LSKYPUPAT ⁽²⁾ String 2006-09-05T08:17:02.890 Time of last RASICAM exposure PV2_0 Float 0.0 PV Distortion Coefficient						PV1_4 PV1_5				
LSK/VAR ⁽²⁾ Float 0.21 RASICAM local sky standard deviation PV1_7 Float 0.002 PV Distortion Coefficient LSK/VHOT ⁽²⁾ Float 0.51 RASICAM local sky fraction above threshold PV1_9 Float 0.002 PV Distortion Coefficient LSK/YHOT ⁽²⁾ Float 0.51 RASICAM local sky fraction above threshold PV1_9 Float 0.002 PV Distortion Coefficient LSK/YDRV ⁽²⁾ Float 0.32 RASICAM local sky normalized power PV1_10 Float 0.002 PV Distortion Coefficient SKYUPPDAT ⁽²⁾ String 2006-09-05T08:17:02.890 Time of last RASICAM exposure PV2_0 Float 0.0 PV Distortion Coefficient						PV1_6			0.0 PV Distortion Coefficient	
LSKYHOT ⁽²⁾ Float 0.51 RASICAM local sky fraction above threshold PV1_8 Float 0.00 PV Distortion Coefficient LSKYPOW ⁽²⁾ Float 0.32 RASICAM local sky normalized power PV1_9 Float 0.00 PV Distortion Coefficient LSKYPDW ⁽²⁾ Float 0.32 RASICAM local sky normalized power PV1_10 Float 0.00 PV Distortion Coefficient SKYUPDAT ⁽²⁾ String 2006-09-05T08:17:02.690 Time of last RASICAM exposure PV2_0 Float 1.0 PV Distortion Coefficient						PV1_7		0.	002 PV Distortion Coefficient	
LSKYPOW ⁽²⁾ Float 0.32 RASICAM local sky normalized power PV_10 Float 0.0 PV Distortion Coefficient SKYUPDAT ⁽²⁾ String 2006-09-05T08:17:02.890 Time of last RASICAM exposure PV_2 Float 0.0 PV Distortion Coefficient										
SKYUPDAT ⁽²⁾ String 2006-09-05T08:17:02.890 Time of last RASICAM exposure PV2_0 Float 0.0 PV Distortion Coefficient PV2_1 Float 1.0 PV Distortion Coefficient				· · · · · · · · · · · · · · · · · · ·		PV1_10				
PV2_1 Float 1.0 PV Distortion Coefficient						PV2_0	Float		0.0 PV Distortion Coefficient	
ID/2 2 Float 0.0 D/ Distortion Conffident						PV2_1 PV2_2	Float Float		1.0 PV Distortion Coefficient 0.0 PV Distortion Coefficient	
HEX ² Integer 1654 DES hex number PV2_3 Float 0.0 PV Distortion Coefficient		Integer	1654	DES hex number		PV2_3			0.0 PV Distortion Coefficient	
TILING ⁽¹⁾ Integer 3 DES tiling number PV2_4 Float 0.0 PV Distortion Coefficient		Integer				PV2_4	Float		0.0 PV Distortion Coefficient	
SISPIVER String ctio-09122012 SISPI software version PV2_5 Float 0.0 PV Distortion Coefficient		String				PV2_5 PV2_6				
Division Source Registration Coefficient PV2_7 Float 0.002 PV Distortion Coefficient						PV2_7	Float	0.	002 PV Distortion Coefficient	
INSTANCE String decam S15H instance name PV2_8 Float 0.0 PV Distortion Coefficient						PV2_8	Float		0.0 PV Distortion Coefficient	
EKRUKS String None SISPI readout errors PV2_9 Float 0.002 PV Distortion Coefficient PV2_10 Float 0.0.P V Distortion Coefficient	LINNORO	ounty	140110	STOLT (CRUCIL ELLOIS						
COMMENT String FITS (Flexible Image Transport System)	COMMENT	String	FITS (Flexible Image Transport Syst	tem)		.vz_10	riodt		o.or v Distoraon coemaent	
CHECKSUM String 0WDA3T940TA90T99 HDU checksum (incl. update time) CHECKSUM String 9i4dC23Z9f3dC23Z ASCII 1's complement checksum	CHECKSUM	String	0WDA3T940TA90T99	HDU checksum (incl. update time)		CHECKSUM	String		ASCII 1's complement checksum	
DATASUM String 0 Data unit checksum (ind. update time) 1459267856 Data checksum for validation file	DATASUM	String	0	Data unit checksum (incl. update time)	n Communit	DATASUM END	String	145926/856	Data checksum for validation file	

Quality Assurance: Image Health

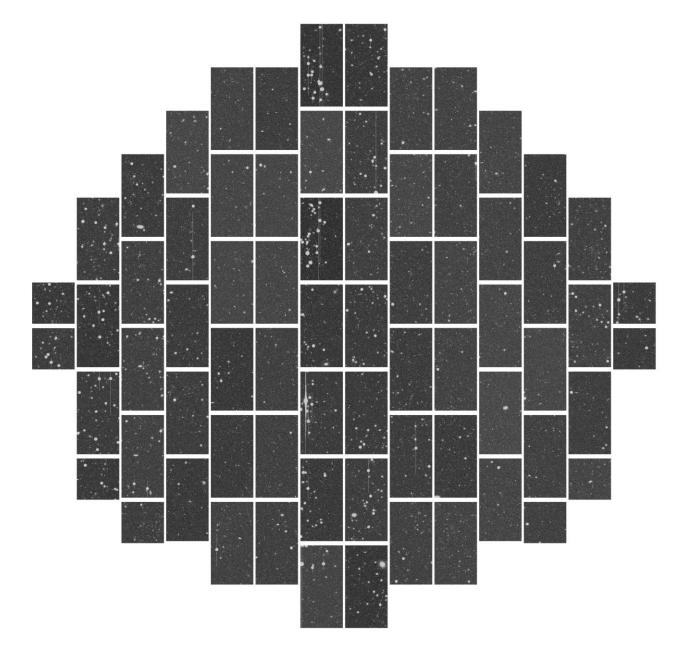
- ImageHealth analyzes every image
- Algorithms include:
 - -Seeing per CCD
 - -Sky noise per CCD
 - Mean, variance per amps for overscan and data regions
- Graphical user interface to represent results with different views:
 - –Data

-PSF

- –Sky
- -CCD Image



Quality Assurance: Comfort Display



Quality Assurance: Quick Reduce

- Quick Reduce analyzes a sample of all image
- DESDM Astronomy codes, but:
 - No crosstalk correction
 - No bad pixel map
 - No illumination correction
 - (still in flux)
- Astrometry & Photometry
- Plots and Histograms:
 - Seeing
 - Distortions
 - Sky brightness
 - Magnitude limit
 - # of objects

-

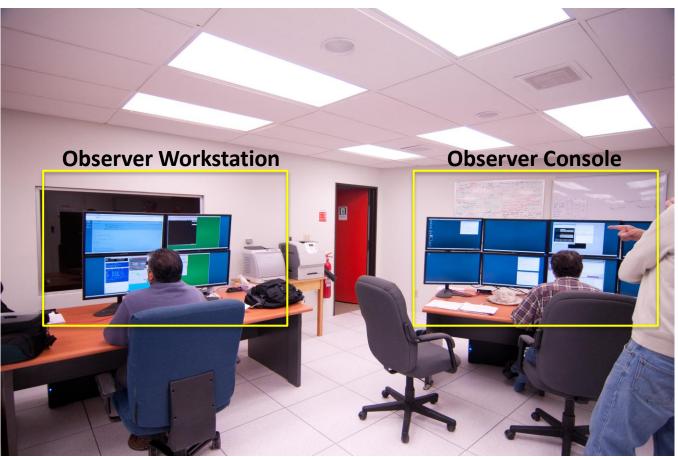
- DES CTIO Portal web interface
- Nightly Summaries
- different views:
 - Data
 - PSF
 - Sky
 - CCD Image

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nance Search	Selection					
You are in page 1.	Found pages between 1 and	29 Choose Pr	ge Previous Page	Next Page	Choose line	es per page: 20 🗸
FILE NAME	DATE	TIME	MJD	RA	DEC	FILTER
SA_95-d	2009-11-12	08:08:36.600000	55147.3393	58.749	0.000	Z
SA_95-d	2009-11-12	08:07:09.800000	55147.3383	58.749	0.000	i
SA_95-d	2009-11-12	08:02:52.800000	55147.3353	58.749	0.000	u
SA_95-d	2009-11-12	08:00:40.600000	55147.3338	58.750	0.000	g
SA_95-d	2009-11-12	07:58:33.400000	55147.3323	58.750	0.000	r
SA_94-a_1a	2009-11-12	01:07:50.300000	55147.0471	43.888	0.000	i
SA_94-a_1a	2009-11-12	01:05:40.600000	55147.0456	43.888	0.000	i
SA_94-a_1a	2009-11-12	01:03:31.300000	55147.0441	43.888	0.000	i
SA_94-A_9a	2009-11-12	07:53:07.700000	55147.3286	44.715	0.000	i
SA_94-A_8b	2009-11-12	07:50:36.200000	55147.3268	44.674	0.000	1
SA_94-A_8a	2009-11-12	07:48:04.100000	55147.325	44.674	0.000	i
SA_94-A_7b	2009-11-12	07:45:32.100000	55147.3233	44.633	0.000	i i
SA_94-A_7a	2009-11-12	07:43:01	55147.3215	44.633	0.000	i
SA_94-A_6b	2009-11-12	07:40:30.200000	55147.3198	44.592	0.000	1
SA_94-A_6a	2009-11-12	07:37:59	55147.318	44.593	0.000	i i
SA_94-A_5b	2009-11-12	07:35:27	55147.3163	44.551	0.000	1
	2009-11-12	07:32:55	55147.3145	44.551	0.000	i
SA_94-A_5a						
SA_94-A_5a SA_94-A_4b	2009-11-12	07:30:23.400000	55147.3128	44.510	0.000	i
	2009-11-12 2009-11-12	07:30:23.400000 07:27:52.100000	55147.3128 55147.311	44.510 44.510	0.000	i

elease Date: Thu Jul 22 18:25:05 2010

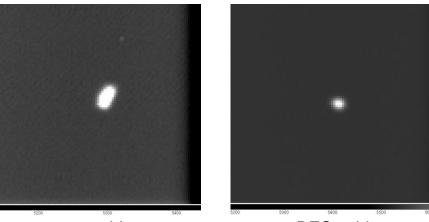
Quality Assurance: Observer Workstation

- Every image will be copied to local disk
- Uncompressed
- Standard astronomy software packages:
 - -IRAF
 - -DS9
 - -IDL (is this needed?)
 - -fv (is this needed?)
 - –fitsutil (is this needed?)–SExtractor
- Run your own analysis and algorithms
- USB external disk



DECam Guider

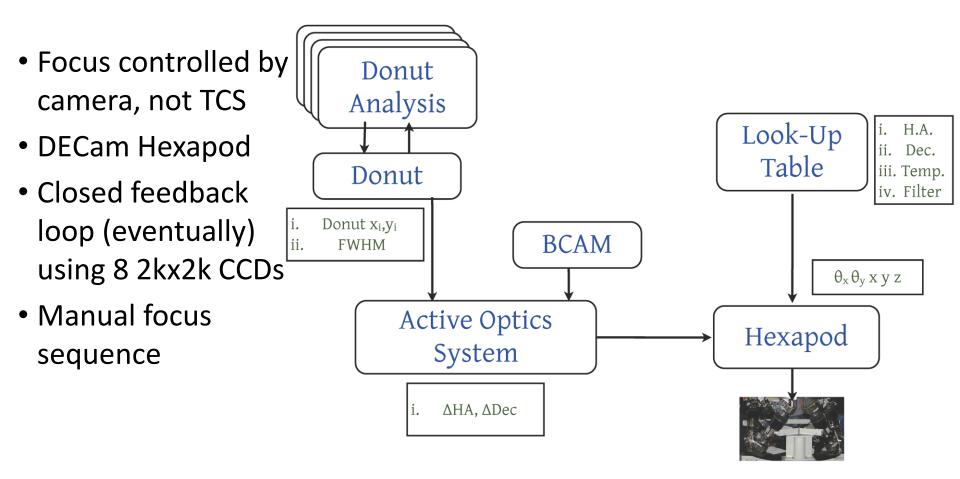
- 4 2kx2k guide CCDs
- Behind the shutter
- •7 s full readout <0.5 s in ROI mode
- •1 Hz update rate
- Modes supported:
 - AUTO (Catalog look up)
 - -SELF
 - USER
- Tested with PreCAM



no guide



DECam Hexapod, Focus



and much more...

Monitoring and Alarms

- Hardware is protected
- Only experts have access to critical components (e.g. CCD substrate voltage)
- Call list, paging system
- Telemetry information archived in DECam DB
- Remote Access (View information, No control)
 - Exposure Browser
 - Telemetry, trend charts, correlations
- Electronic Logbook

Summary

- DECam readout time ~20 seconds
- DECam image size 1 GB (~600 MB compressed)
- Provided QA:
 - Image Health
 - Quick Reduce
 - Comfort Display
- Observer QA:
 - Observer Workstation
- Feedback, questions: kh@physics.osu.edu