DECam Commissioning Update: Integration and Testing during Observations

All-Experimenter’s Meeting
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11/5/12
DES: A Dark Mission

- Measure the time-dependence of Dark Energy ...
- ... with a 500-Mpixel camera and 3 sq. deg field of view.
- ... via 5000-sq. deg. broadband imaging of galaxies and supernovae in the Southern Hemisphere ...
- ... over the course of 5 years on the Blanco 4m at CTIO.
Evolution of the Dark Energy Camera (DECam)

Design [2003]

Testing [2010]

Installation [2012]

[Full-scale simulator at FNAL]
Recent Schedule

- **September 12, 2012**: First Light!
- **September - October**: Commissioning
  - Oct 9-16: Repairs (offline)
  - Oct 26 - Nov 1: Calibration (offline)
- **November**: Science Verification
Overview: DECam Progress in October

- Focus on the Filter Changer Mechanism [Refurbishment]
- Running and training DECam Operations
- Address remaining issues component-by-component
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Filter Changer Repair Schedule

- **3 days**: Remove filters and filter changer from cage.
- **4 days**: Refurbish.
- **2 days**: Insert filters and filter changer.
The Filter Changer *Strikes Back*

Side View

LEDs off
The Filter Changer Strikes Back

LEDs off
The Filter Changer **Strikes Back**

LEDs on
Return to Commissioning

- LEDs deactivated safely.
- Filter Changer works better than before.
Return to Commissioning

- Learn the operating system.
- Train users/observers.
- Monitor and troubleshoot integrated operations.
A few clouds

☹ 9 days for FCM repair
☹ 5 days for DECal Ops

☺ 15 nights of observations in October
Ground Control

Survey Image System Process Integration
SISPI: the DECam Whisperer

Image Health

Instrument Control

Exposure Control

“Comfort” Monitor

Additional Usual Suspects: Annis, Neilsen, Tucker, Roodman (SLAC), Fausti and da Costa (Brazil)
DECam Subsystem Status

- **Focus Loop**
- DECal Integration
- Seeing and Image Health
- Guiding
- Pointing/tracking (new TCS still commissioning)
- RASICAM (Radiometric All Sky Infrared Camera): monitor cloud cover
Focus on Donuts

• 8 focus CCDs are out of plane --- 4 above and 4 below the observation CCDs.

• Stars appear as “donuts” when out of focus.

• When donuts from the 4 CCDs above are the same size as the 4 from below, the observation CCDs are in focus.

• Telescope can be adjusted to micron precision to make the “focus donuts” the same size and thus focus the Observation CCDs
DECam Subsystem Status

- ✔ Focus Loop
- ✔ DECal Integration
- ✔ Seeing and Image Health
- ✔ Guiding
- ✗ Pointing/tracking (new telescope control still being commissioned)
- ✔ RASICAM (Radiometric All Sky Infrared Camera): monitor cloud cover
Clusters in the Early Days

DECAM r,i,z 2100s

SDSS r,i,z 2700s
Next Time:
Science Verification!