DES Status Report

All Experimenter's Meeting
2014 Sept. 22

Brian Yanny (FNAL) reporting
So far DES has had 24 scheduled observing nights, 9 half-nights and 15 full nights.

<table>
<thead>
<tr>
<th></th>
<th># Nights</th>
<th>Total Hours</th>
<th>Hours Observing</th>
<th>Lost Camera or Telescope</th>
<th>Lost Obs. Error</th>
<th>Lost Weather</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aug.</td>
<td>8 ½</td>
<td>87 ¾</td>
<td>53 ¾</td>
<td>0</td>
<td>0</td>
<td>34</td>
</tr>
<tr>
<td>Sept.</td>
<td>11</td>
<td>111</td>
<td>70 ½</td>
<td>0</td>
<td>0</td>
<td>40 ½</td>
</tr>
<tr>
<td>Total</td>
<td>19 ½</td>
<td>198 ¾</td>
<td>123 ¼</td>
<td>0</td>
<td>0</td>
<td>74 ½</td>
</tr>
<tr>
<td></td>
<td>100%</td>
<td>62%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>37%</td>
</tr>
</tbody>
</table>

The first 7 half-nights were great and included seeing records in all DES filters.
Since then “clouded out” 7½ nights (out of 16).
9/19 was best night in 3 weeks.
Individual WF exposures are graded “Good” or “Bad” as part of the DESDM “1st Cut” output. This informs the “Exposure Table” on the mountain so OBSTAC knows if the exposure needs to be redone.

Right: WF tilings after night of Sept. 19

- Lt Blue: last Year
- Dk blue: this year,
- Red: last night

* DQ through Sept. 18th
In Y1 the SN fields had a median # days between revisits of about 6.5 days. The maximums gaps were 11 to 16 nights.

Gaps so far in Y2 are 12 to 21+ nights (see right)

In Y2, bad weather bracketed a 3 night stretch when DES didn’t have the telescope.

And (in the gap) when we got observations they had low S/N and were declared “Bad”

<table>
<thead>
<tr>
<th>Date</th>
<th># SN Images</th>
<th># SN Good</th>
<th># SN “Bad”</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aug.</td>
<td>228</td>
<td>116 (51%)</td>
<td>112</td>
</tr>
<tr>
<td>Sept.</td>
<td>286</td>
<td>238 (83%)</td>
<td>48</td>
</tr>
<tr>
<td>Total</td>
<td>514</td>
<td>354 (69%)</td>
<td>160</td>
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</tbody>
</table>
Recent Improvements for DECam/Blanco

- New Dome Environmental Controls: 2 large glycol-cooled air-handlers will better maintain the primary mirror at or just below the air-temperature, minimal temperature gradient within the dome, and internal and external air temperatures matched. Finished, now commissioning.
- New Primary Mirror Support Pad air-pressure controls
  - The present system controls mirror shape depending on gravity vector with an astigmatic correction. 33 of 33 with higher resolution air-pad controls installed. Perhaps some improvement in seeing is already being attained.
  - D0Nut studies indicate that primary mirror aberrations can be better zeroed-out. This new system will need commissioning to achieve the improvement.

Both of these systems are expected to lead to better image quality.
DECam is working well (when the dome is open)
We are encouraged that during observing in Y2 the shutter was open ~69% of the time. We averaged 63% during Y1 and our monthly best in Y1 was 66%.
DES Observers

Y2 DES Observers so far from FNAL, Texas A&M, CTIO, U. Chicago, ANL, BNL, Brazil
Software refactoring: A two year collaboration between Fermilab and NCSA (at U of Illinois) to rework the 'wrapper' and 'workflow' systems for DES. This work is now nearly Complete (coadd pipeline needs refactoring).

Year 2 Production Processing: 4/5 major DES pipelines (all but 'coadd') are being run in the refactored system, and use (100-300 cores at ~40% duty cycle) is being made of the fermigrid nodes for DES production. (issue with condor/globus-url-copy being worked).

This is a big success.
In the DES Survey, Stars are the 'Cosmic Rays' used for calibration and checking of the galaxy Measurements.

DECam image of Omega Centauri (g,r,i band 3x4 seconds each)
Image Credit: Kuropatkin
Color-Magnitude diagram

BLUE Stars
(Blue Horizontal Branch)

RED Stars
(Red Giants)

Grey Stars
(Main Seq.)

Credit: K. Grabowski
Omega Centauri (largest Milky Way halo cluster). Shows good seeing (1''), good astrometric registration between g-r-i filters, good depth/completeness.

Red: Red Giant, Yellow/Green: Sub-giant, K-giant  Blue:  Horizontal Branch  Grey: Main sequence star