Dark Energy Survey Operations

Tom Diehl
All-Experimenter’s Meeting
September 12, 2016
We got 60% of our expected average season in Y3. Plus side: 4-6 good exposures in the full survey field. Quality not quite as good on the West side.
Clear skies indicator for CTIO

http://iri.columbia.edu/our-expertise/climate/forecasts/ens0/current/
Water Temp. Model Trends for Y4 La Nina

http://iri.columbia.edu/our-expertise/climate/forecasts/enso/current/

• Climate forecast predict a good Y4.
Status of auxiliary systems

- ✔ GPSMon monitors precipitable water vapor in the atmosphere
- 😞 Anemometer
- ✔ CTIO DIMM (2) measures true seeing
- ✔ RasiCam (all-sky IR camera) measures cloud cover, informs Calibration WG if photometric conditions. May ‘16 maintenance by Kevin Reil (SLAC).
- ✔ aTmCam measures atmospheric transmission in 4 filters. Maintenance in Aug.16
Status & Improvements for DECam/Blanco for Y4

New 4MAP LUT

- New 4MAP default (mid 2015) decreases astigmatism
- New 4MAP LUT testing – didn’t make a significant improvement
- Testing a 4MAP PID control loop in June?
- Aaron Roodman, Roberto Tighe, Alistair W., Tim A. have a big role in this.

Feb 2016 Maintenance trip
(Alex, Marcelle, Andy, Otto)
- LN2 pump replacement,
- Understanding the operation of He cryocoolers
- Improved LN2 operations so that it’s a closed loop system (140W cooling headroom)

Fall 2016 Maintenance trip
- LN2 pump replacement, new bearings w/ new material
- Replacement 7s, 7r lines with ones that are easier to remove/install

✔ C1 Dust Removed
Camera & Telescope Status

- Dust removed from 1st Lens will give us 4% more light

- Analysis of “out-of-focus” CCDs provides a correction for astigmatism
- 34,000 lb Blanco Primary Mirror is now under active control
- Provide a slight overall improvement in image quality
Tactical Changes For Y4

- DES Wide Field exposures are 90s long griz-band filters but 45s long for Y-band
  - Change the Y-band exposure time to 90s and do away with tilings 8 and 10.
  - Saves ~1645*2*25s = 32k seconds: 270 more 90s exposures, probably help only the z-band.

- SN priority – same as Y1 to Y3

- WF Priority
  - Observe objects transiting (meridian) rather than objects setting
  - finish tiling #5, then #6 before going to Y4 tiles
Observing Summary
(up-to-date as of This Morning)

- Y4 is off to a very good start

<table>
<thead>
<tr>
<th>Season</th>
<th># Nights</th>
<th>Total Hours</th>
<th>Observing (%)</th>
<th>Lost Camera (%)</th>
<th>Lost Telesc. (%)</th>
<th>Lost Weather (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y1</td>
<td>105</td>
<td>888 ¼</td>
<td>85</td>
<td>3</td>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td>Y2</td>
<td>105</td>
<td>928 ¾</td>
<td>84</td>
<td>&lt; ½</td>
<td>&lt; ½</td>
<td>15</td>
</tr>
<tr>
<td>Y3</td>
<td>105</td>
<td>969 ¾</td>
<td>66</td>
<td>1</td>
<td>3</td>
<td>30</td>
</tr>
<tr>
<td>Y4 Aug.</td>
<td>6 ½</td>
<td>63 ¼</td>
<td>87</td>
<td>½</td>
<td>0</td>
<td>12</td>
</tr>
<tr>
<td>Y4 Sep.</td>
<td>9 ½</td>
<td>99 ½</td>
<td>95</td>
<td>0</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>Y4 Total</td>
<td>16</td>
<td></td>
<td>91 ½%</td>
<td>&lt; ½%</td>
<td>3%</td>
<td>5%</td>
</tr>
</tbody>
</table>
More Y4 Results

- SN Survey is on track, the gap after the 1\textsuperscript{st} set is due to a long stretch DES off the telescope

- Finally, we seem to be running 4 or 5% more efficiently (fraction of time shutter is open) than ever. In past was \(~65\%\), now higher. Some of this because the Blanco slews faster than before
DES Operations Summary

- Camera & Telescope are working well
- August is usually a “bad weather” month but this year was best month in the past year
- Y4 got off to a good start
- We are optimistic that this will be a better than average year for DES – and by that we mean 10% better than Y1.

4th Ann. of “Official 1st Light”