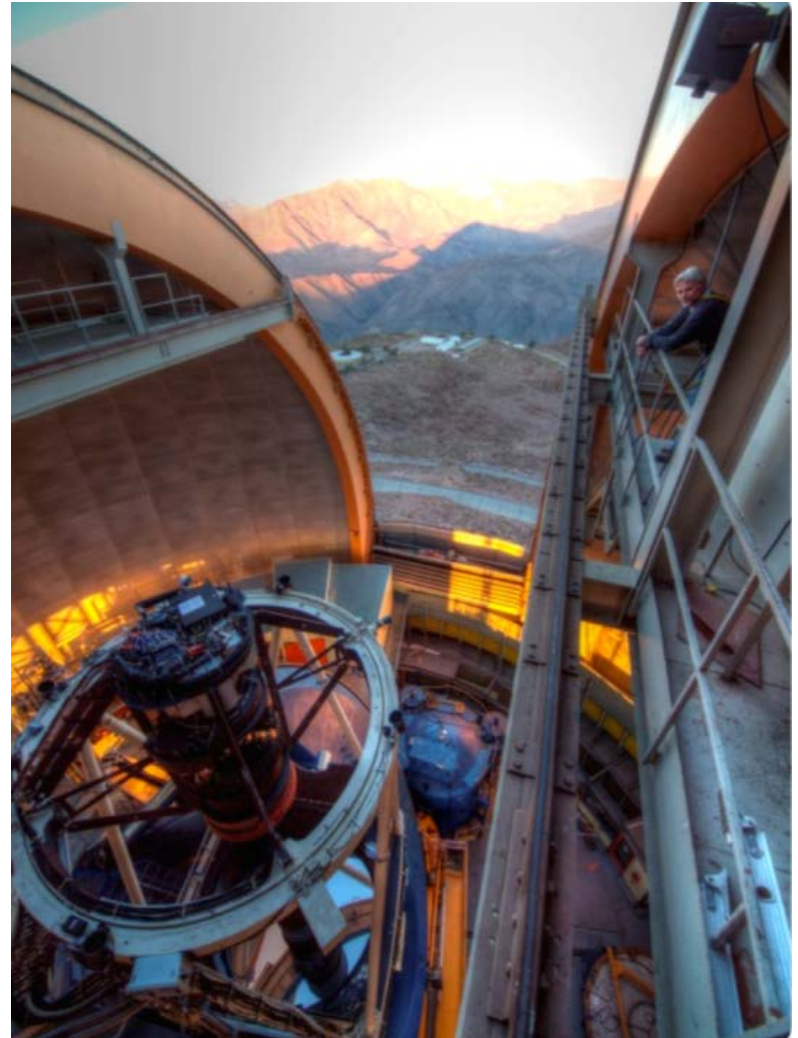




DARK ENERGY
SURVEY

Dark Energy Survey Operations

Tom Diehl
All-Experimenter's Meeting
September 12, 2016

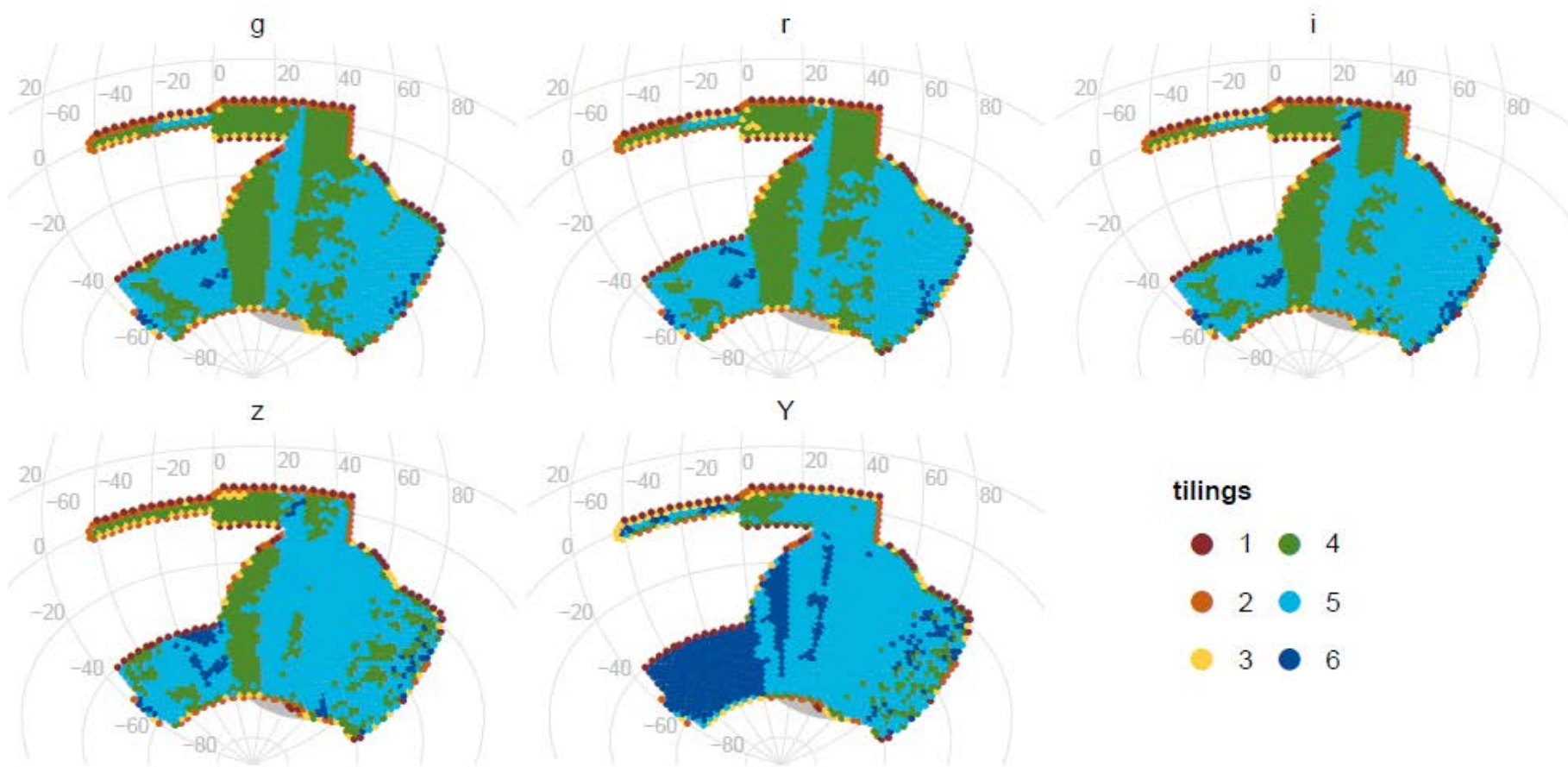




DES Finished 3 of 5 observing seasons

End of Y3 WF Survey Status by Filter

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SURVEY



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.

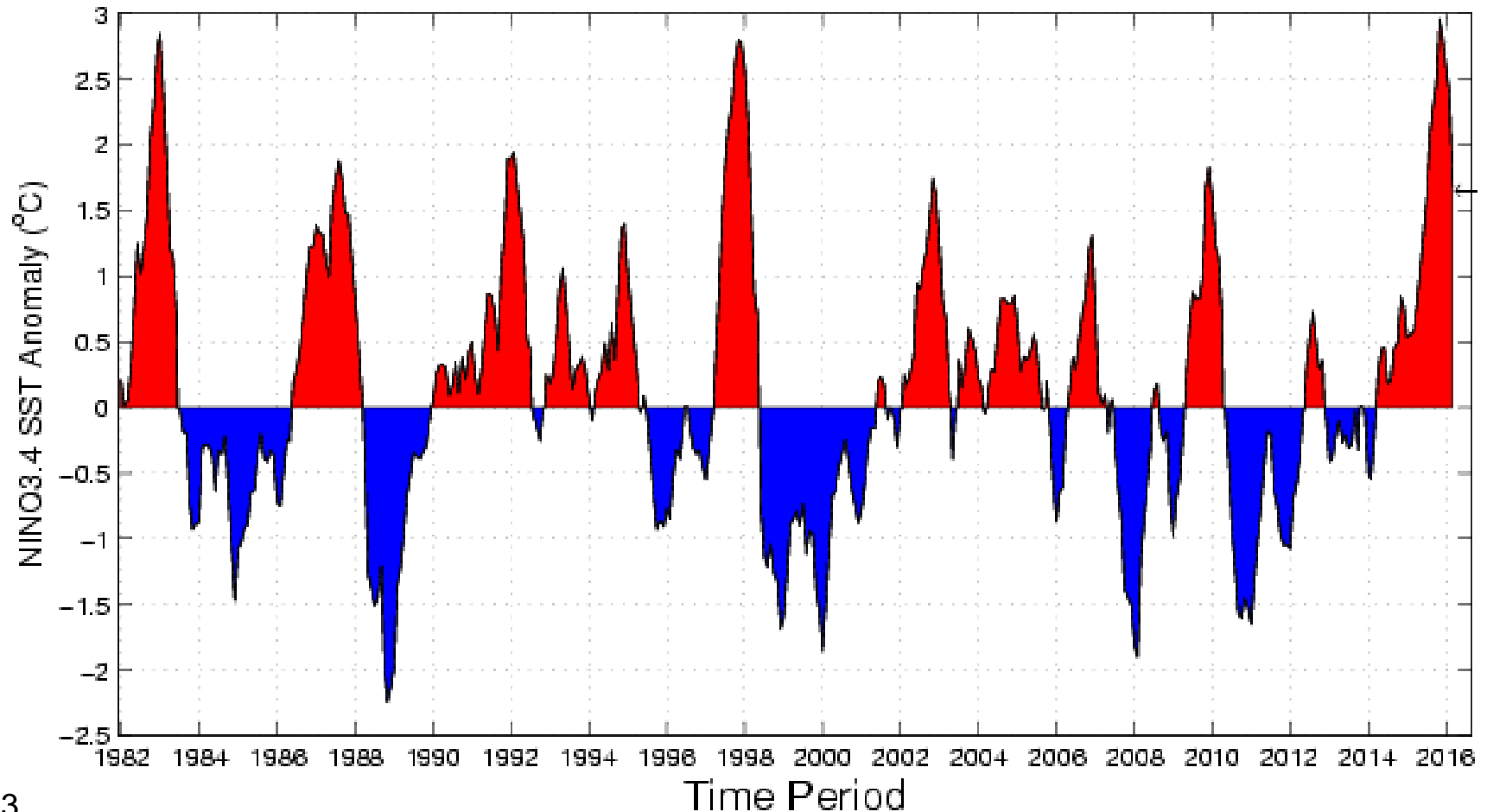


Clear skies indicator for CTIO

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

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Historical NINO3.4 Sea Surface Temperature Anomaly

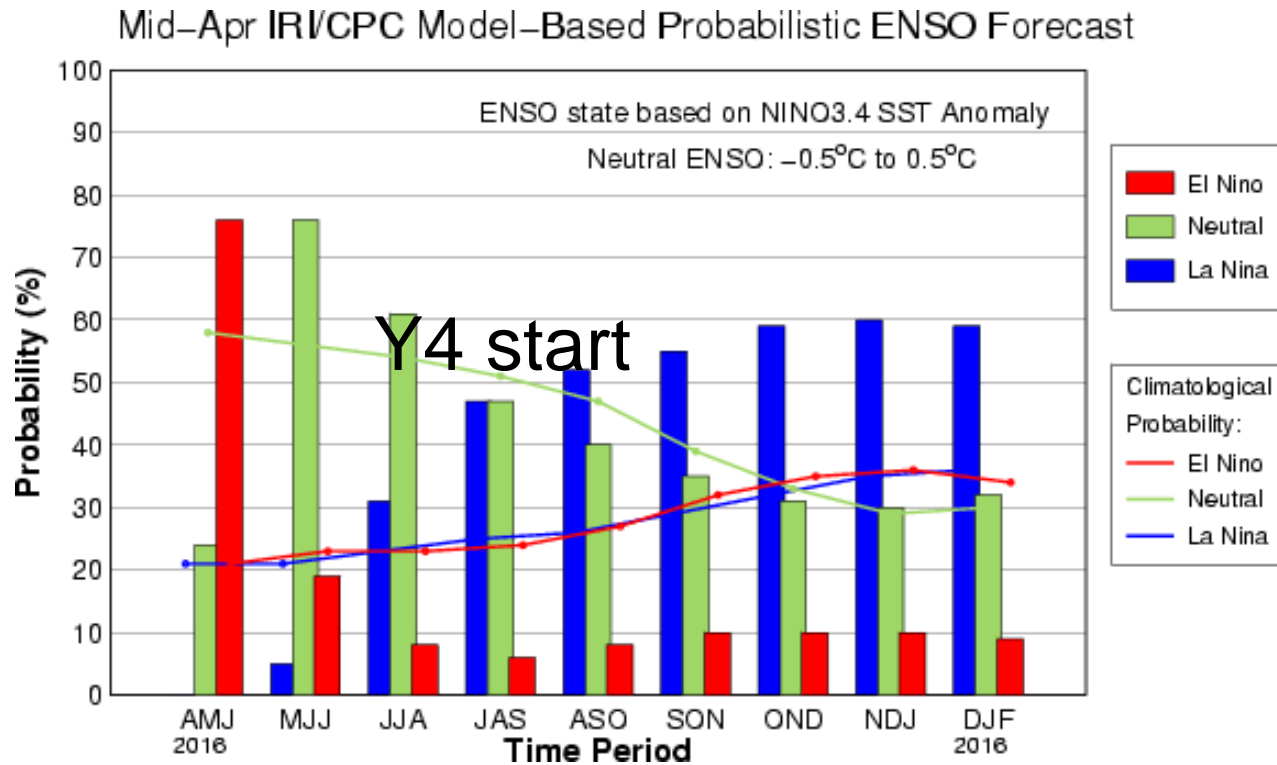




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Water Temp. Model Trends for Y4 La Nina

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



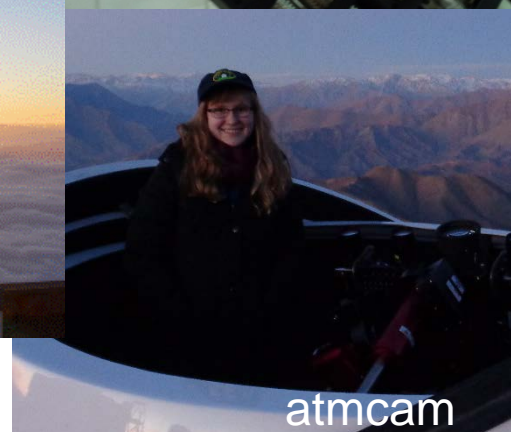
- Climate forecast predict a good Y4.



Status of auxiliary systems

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- ✓ 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.
- 5 Maintenance in Aug.16





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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.



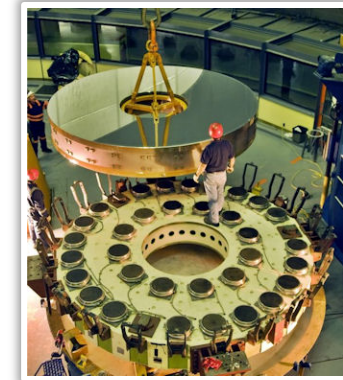
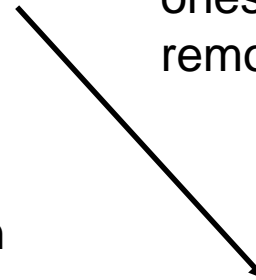
Feb 2016 Maintenance trip (Alex, Marcelle, Andy, Otto)

- 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

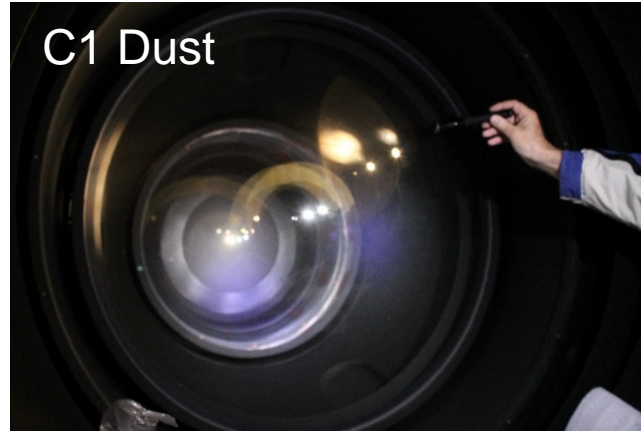




Camera & Telescope Status

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- 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

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SURVEY

- 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 $\sim 1645 \times 2 \times 25\text{s} = 32\text{k}$ 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)

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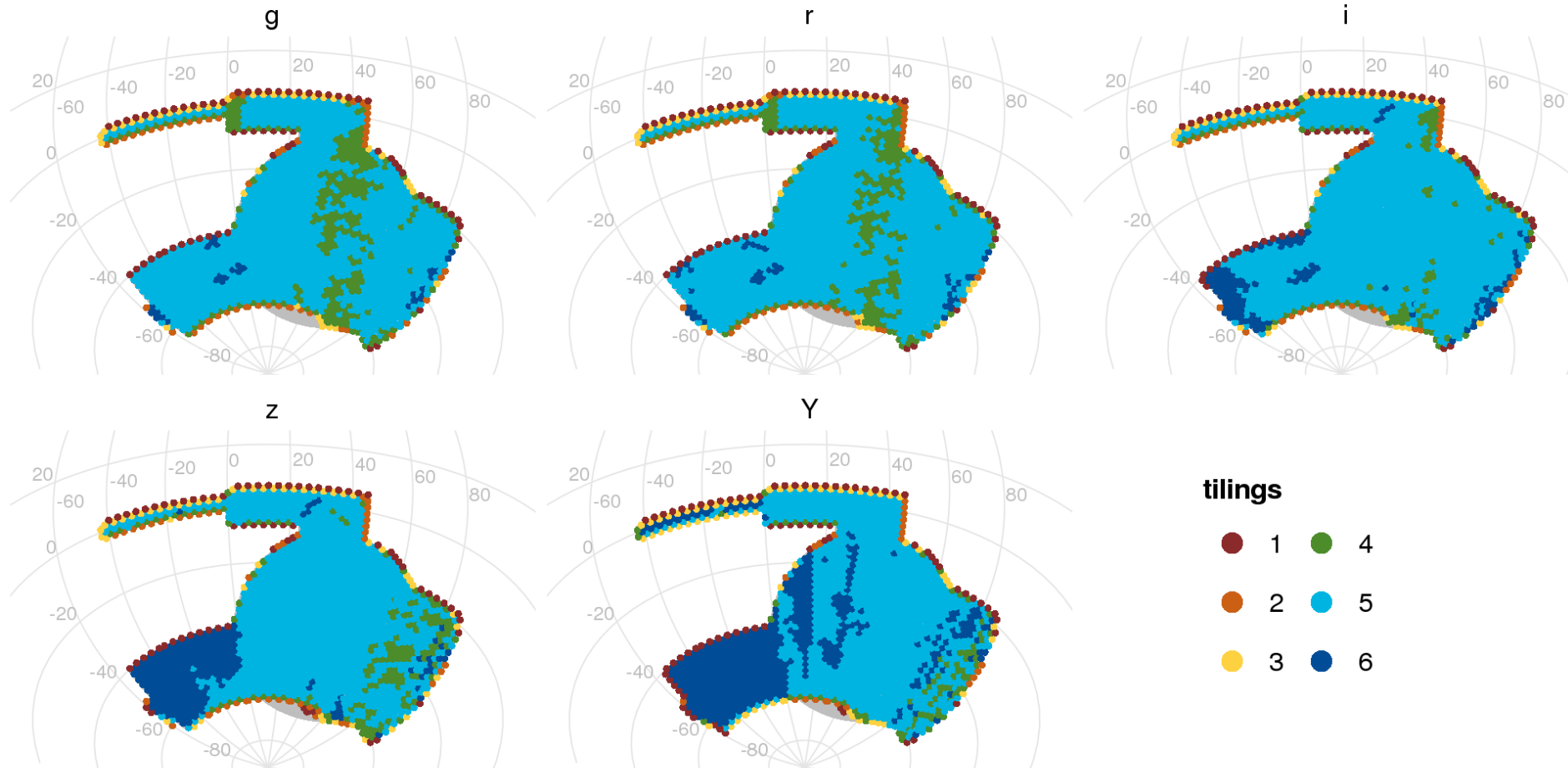
- Y4 is off to a very good start

Season	# Nights	Total Hours	Observing (%)	Lost Camera (%)	Lost Telesc. (%)	Lost Weather (%)
Y1	105	888 $\frac{1}{4}$	85	3	2	10
Y2	105	928 $\frac{3}{4}$	84	$< \frac{1}{2}$	$< \frac{1}{2}$	15
Y3	105	969 $\frac{3}{4}$	66	1	3	30
Y4 Aug.	6 $\frac{1}{2}$	63 $\frac{1}{4}$	87	$\frac{1}{2}$	0	12
Y4 Sep.	9 $\frac{1}{2}$	99 $\frac{1}{2}$	95	0	5	0
Y4 Total	16		91 $\frac{1}{2}$ %	$< \frac{1}{2}$ %	3%	5%



WF Status

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9/12/16

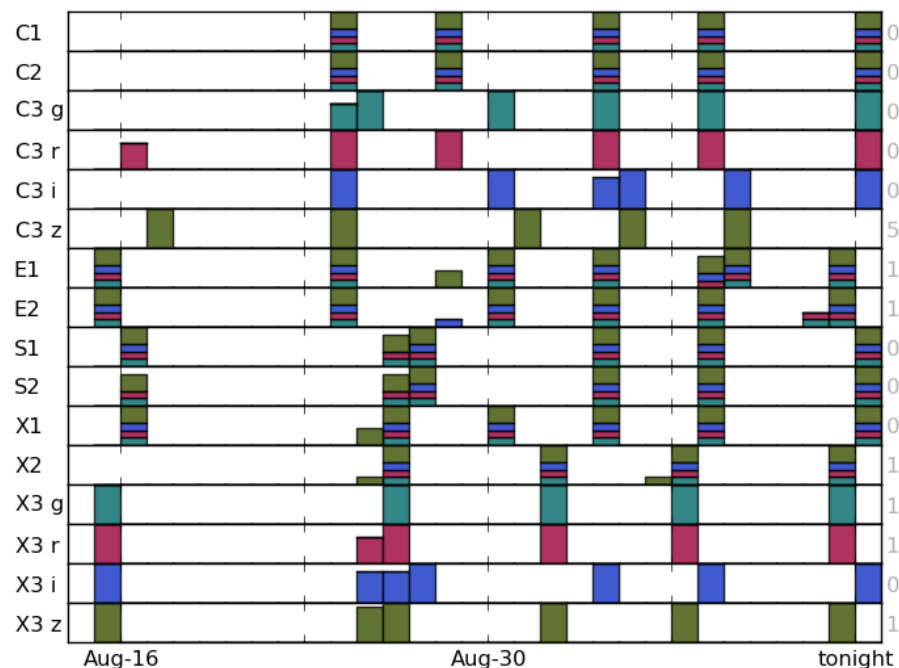


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More Y4 Results

- SN Survey is on track, the gap after the 1st 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

Y4 SN Cadence



9/12/16

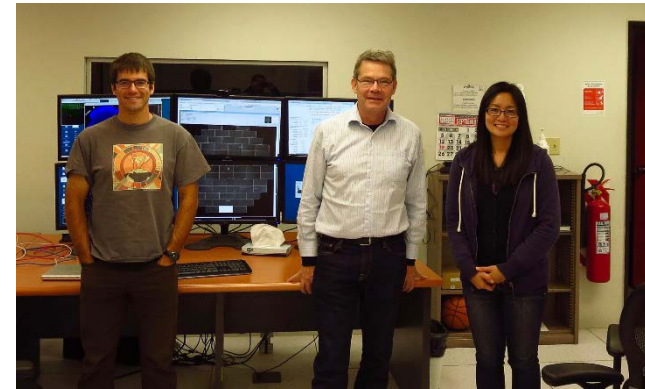


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DES Operations Summary



- 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”