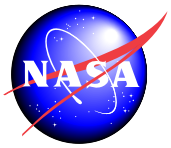


CALIPSO Mission Status Update

Payload Status

November 13, 2007

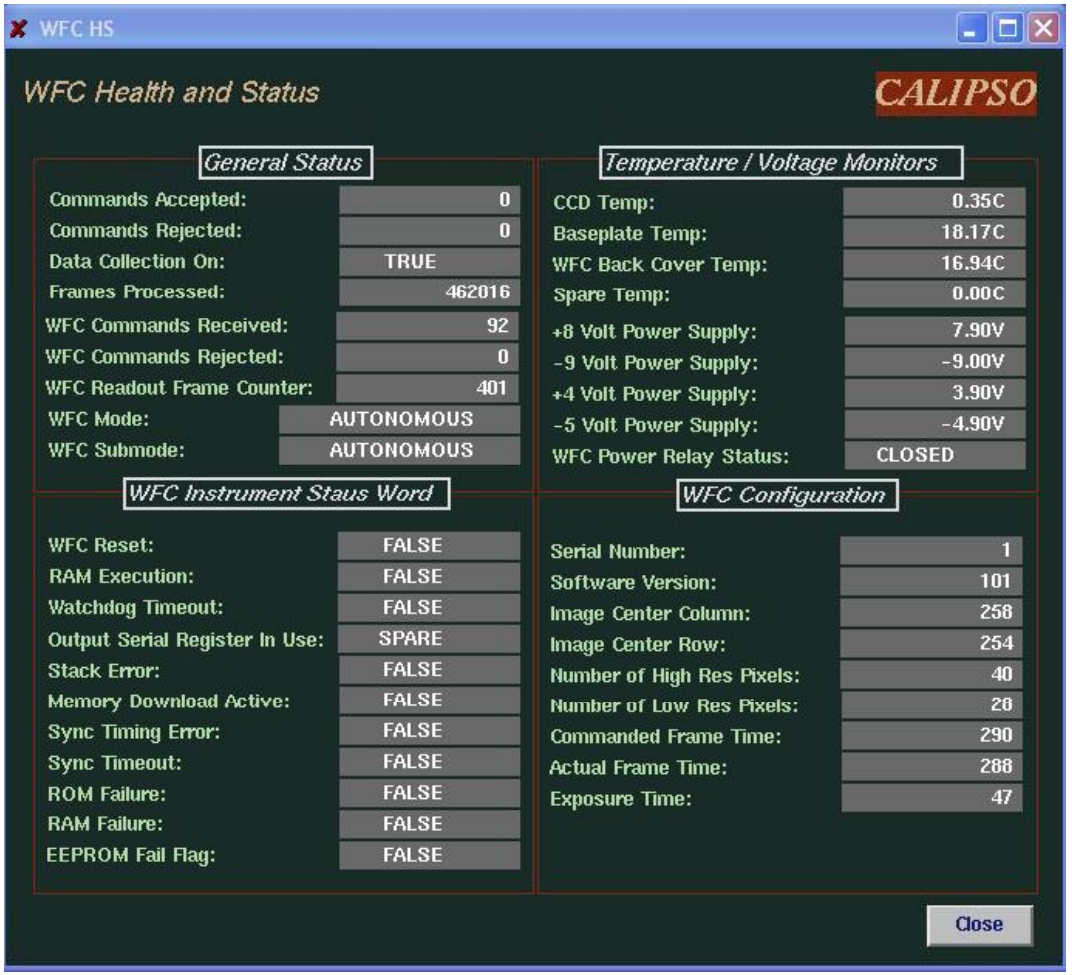
SSAI/ Ron Verhappen
SSAI/Robert Borchardt
NASA / David MacDonnell
NASA / Mike Cisewski

Wide Field Camera

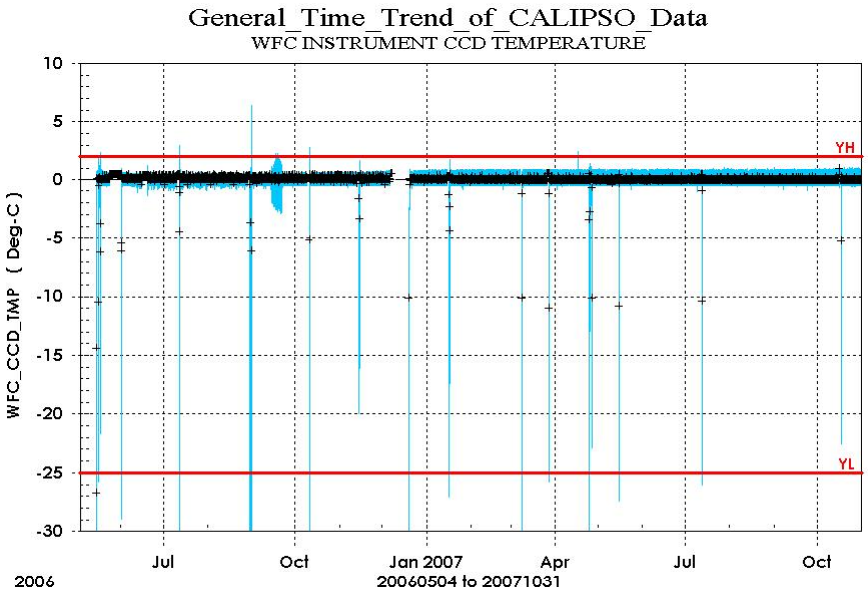
SSAI/ Ron Verhappen

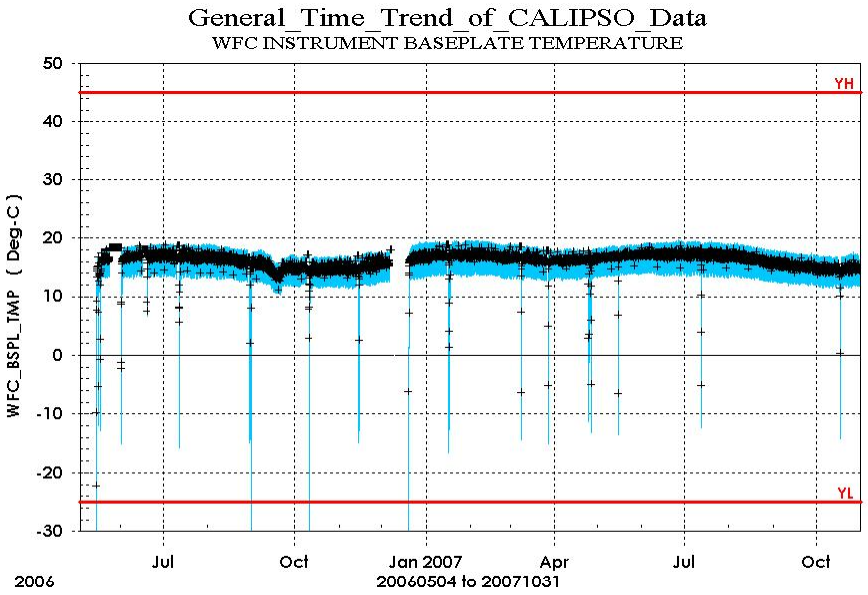
WFC Overview

- No FDIR Events
- All Temperatures and Voltages are Nominal
- No Adjustments required

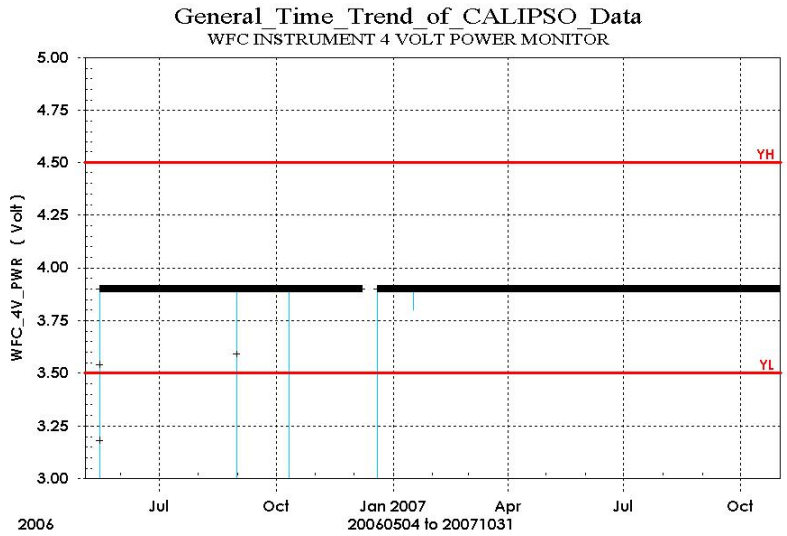


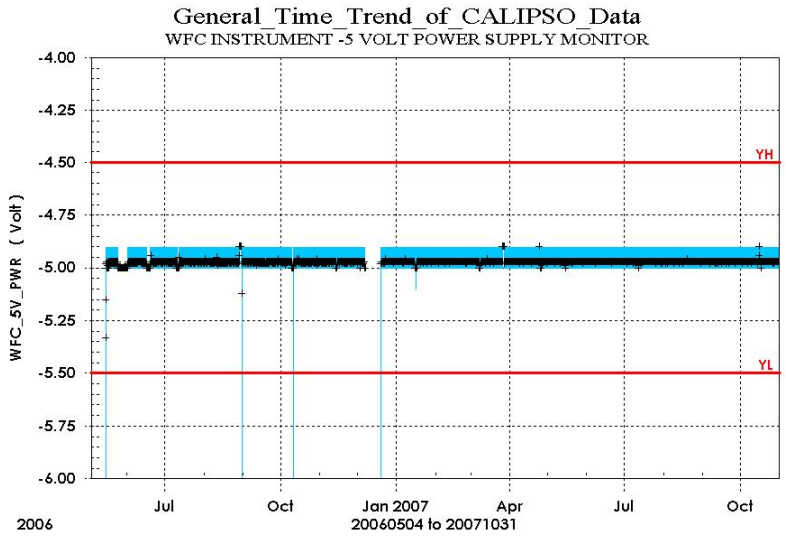
WFC Temperatures

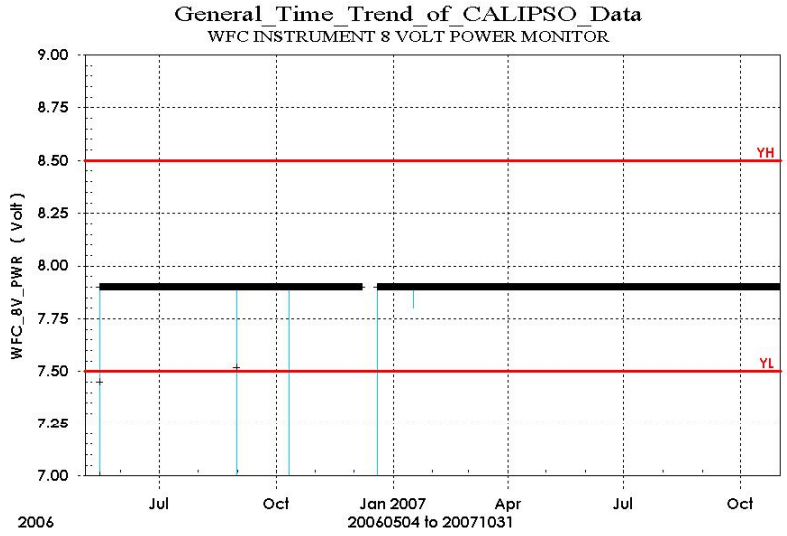


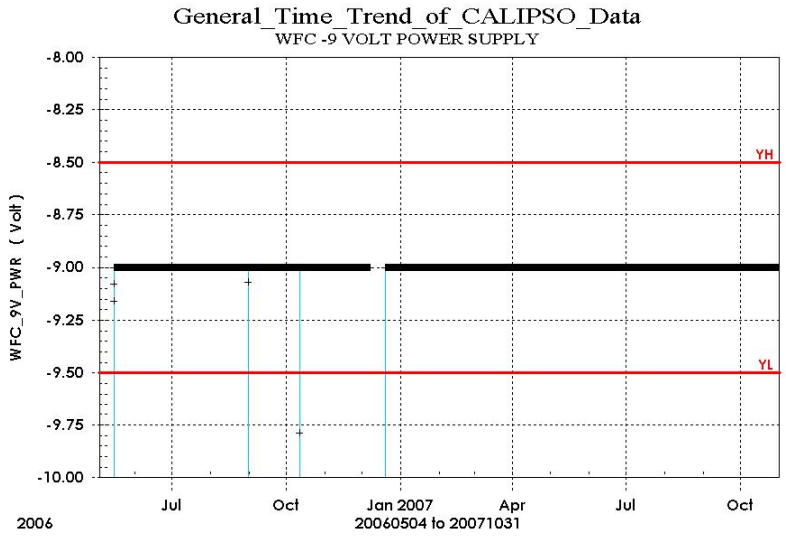


WFC Voltages







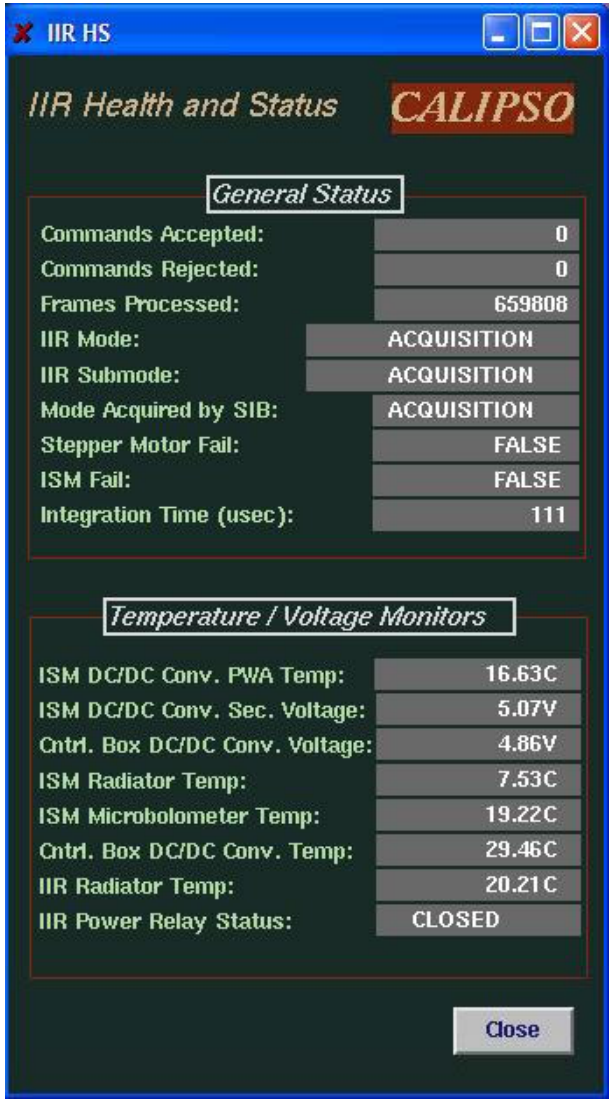


Imaging Infrared Radiometer

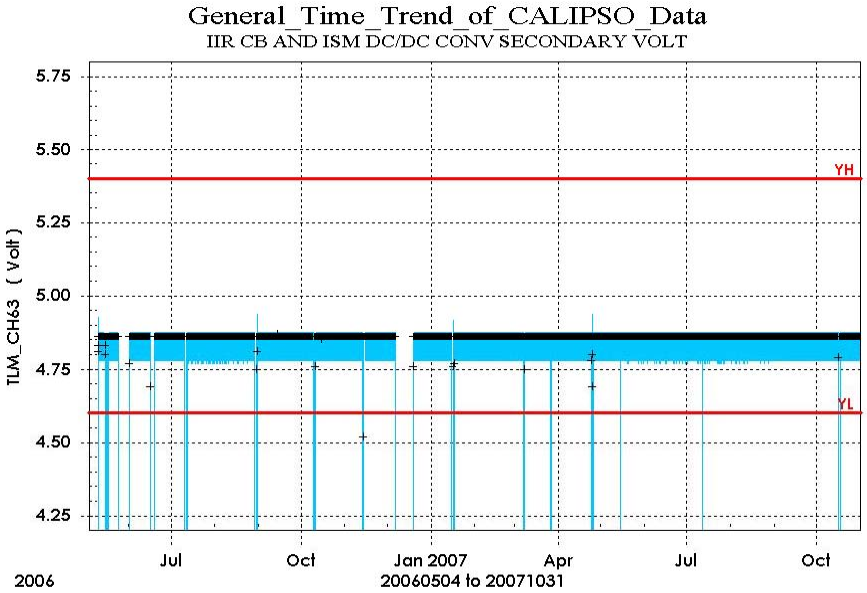
SSAI/ Ron Verhappen

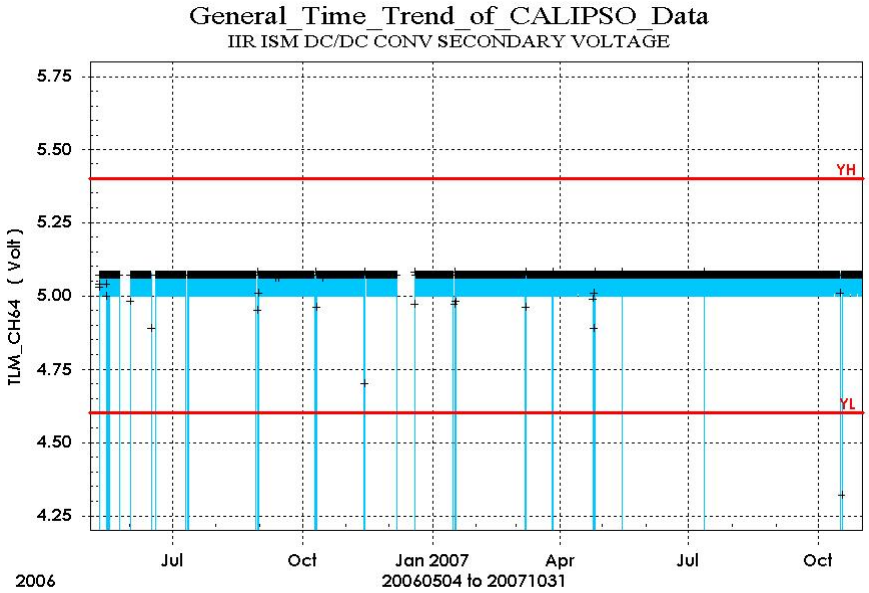
IIR Health

- Power Consumption Nominal
- No Adjustment required since CTA set point update
- No FDIR Events



IIR Voltages

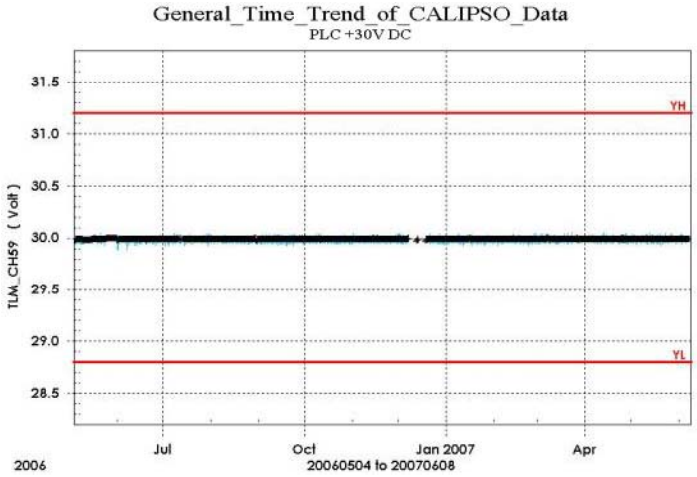


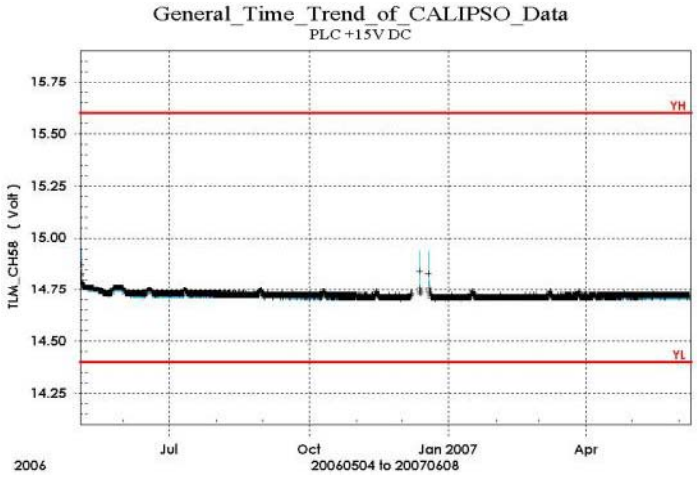


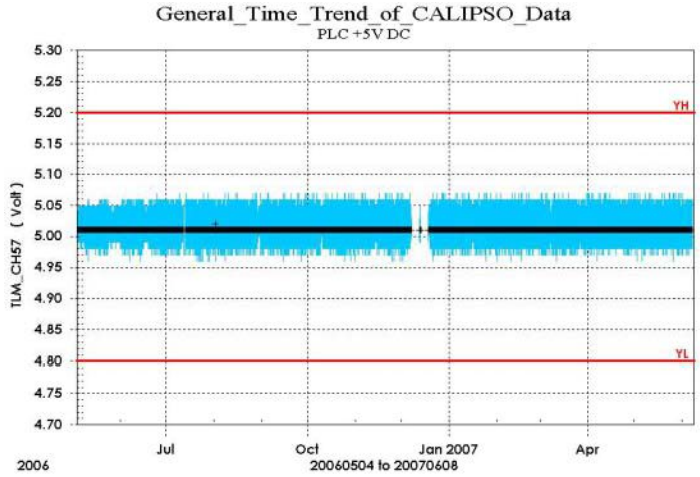
Payload Controller

SSAI/ Ron Verhappen

PLC Voltages

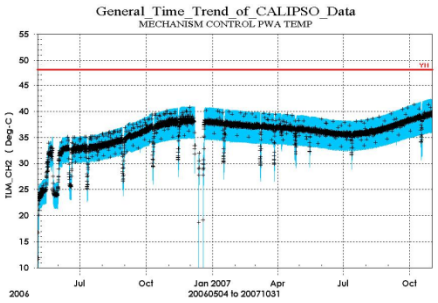


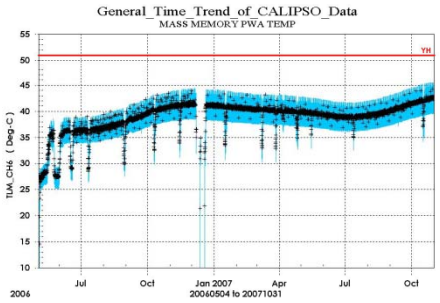


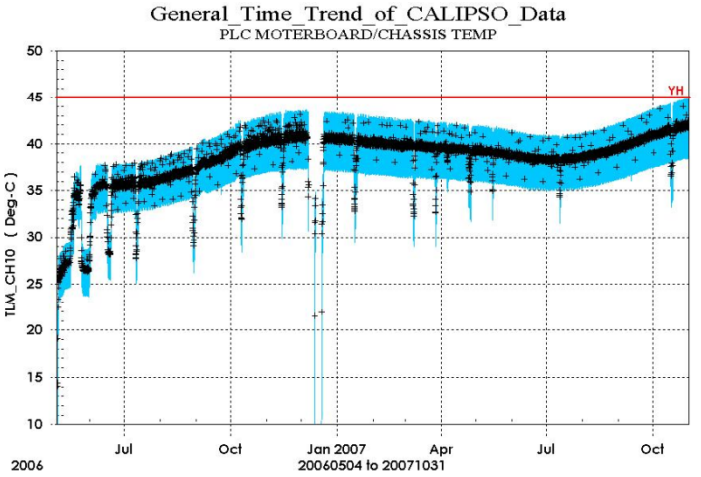


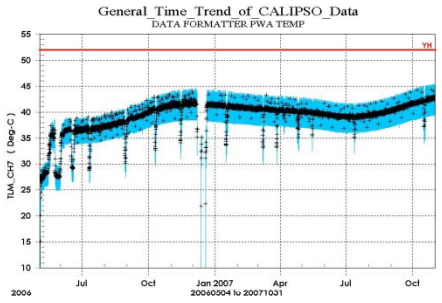
PLC Temperatures

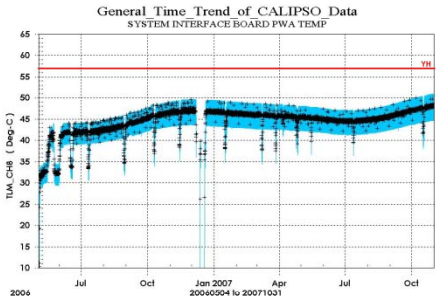
- Temperatures are nominal
  - Excluding the LVPS

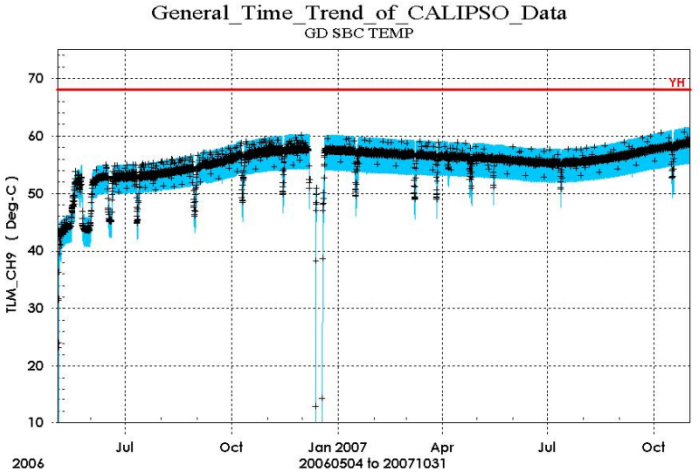






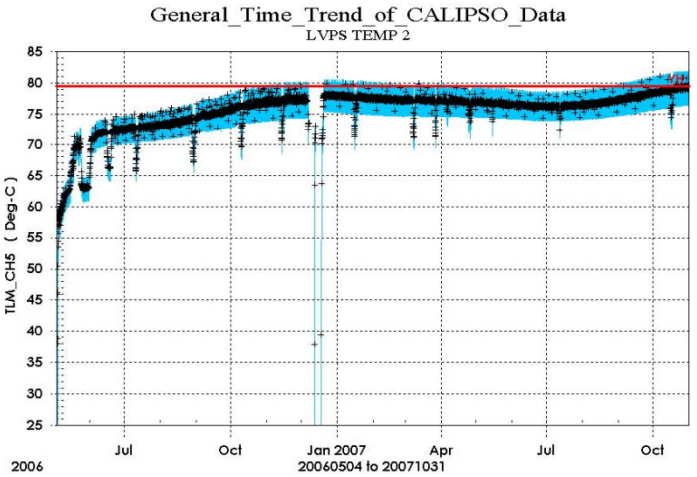


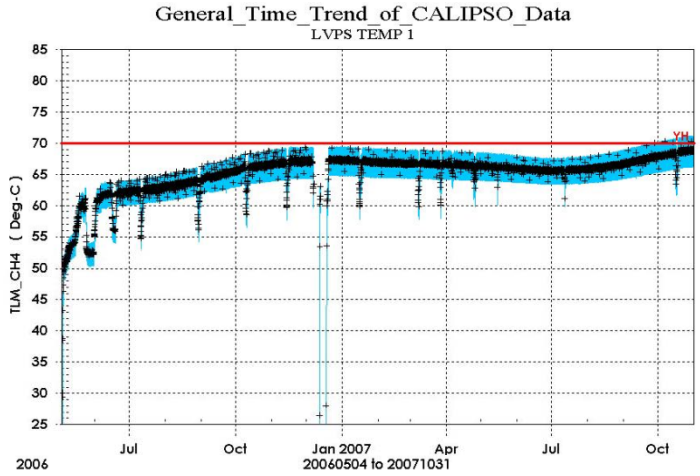




Low Voltage Power Supply (LVPS) (CALOPS0025N)

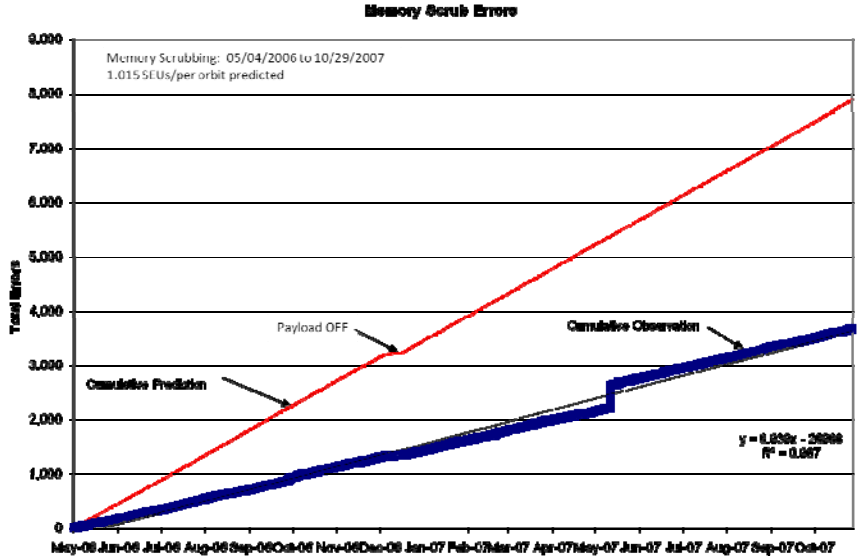
- LVPS TLM_CH5 Approaching Red FDIR Limit during High Beta Angles
- Flight Red Limit increased by 2°C.
- Mission Request to Increase PLC CTA during Solar Flares
  - Implemented
- Mission Request to Increase PLC CTA Temperature during Operations in Review
  - Same philosophy as CTA heater setting for the active laser during operations

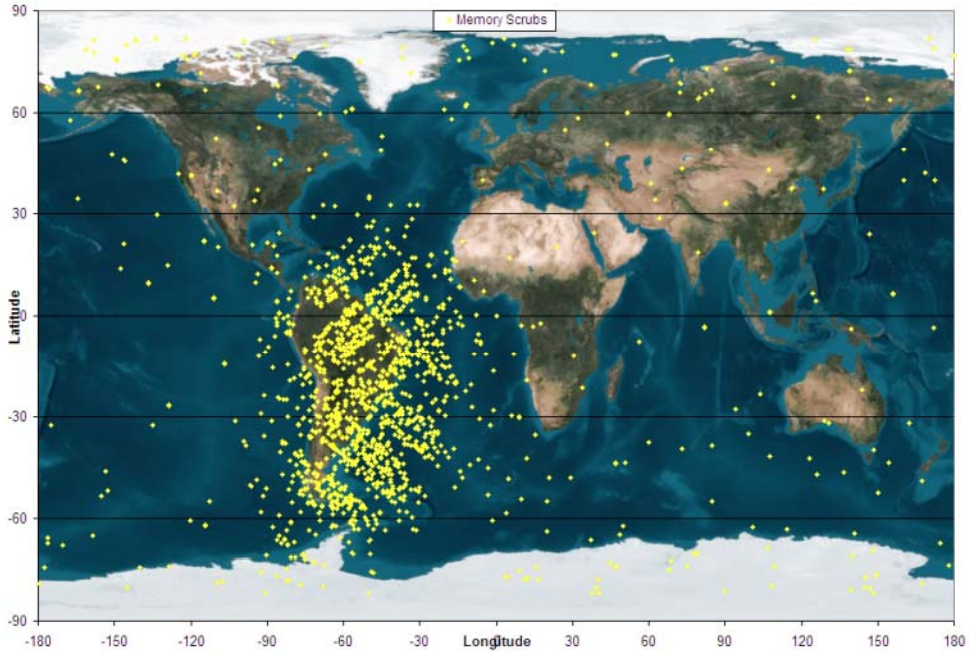




PLC Radiation Effects

- PLC operating nominally in the on-orbit radiation environment
- Memory scrub errors & CPU Miscompares are well under predictions

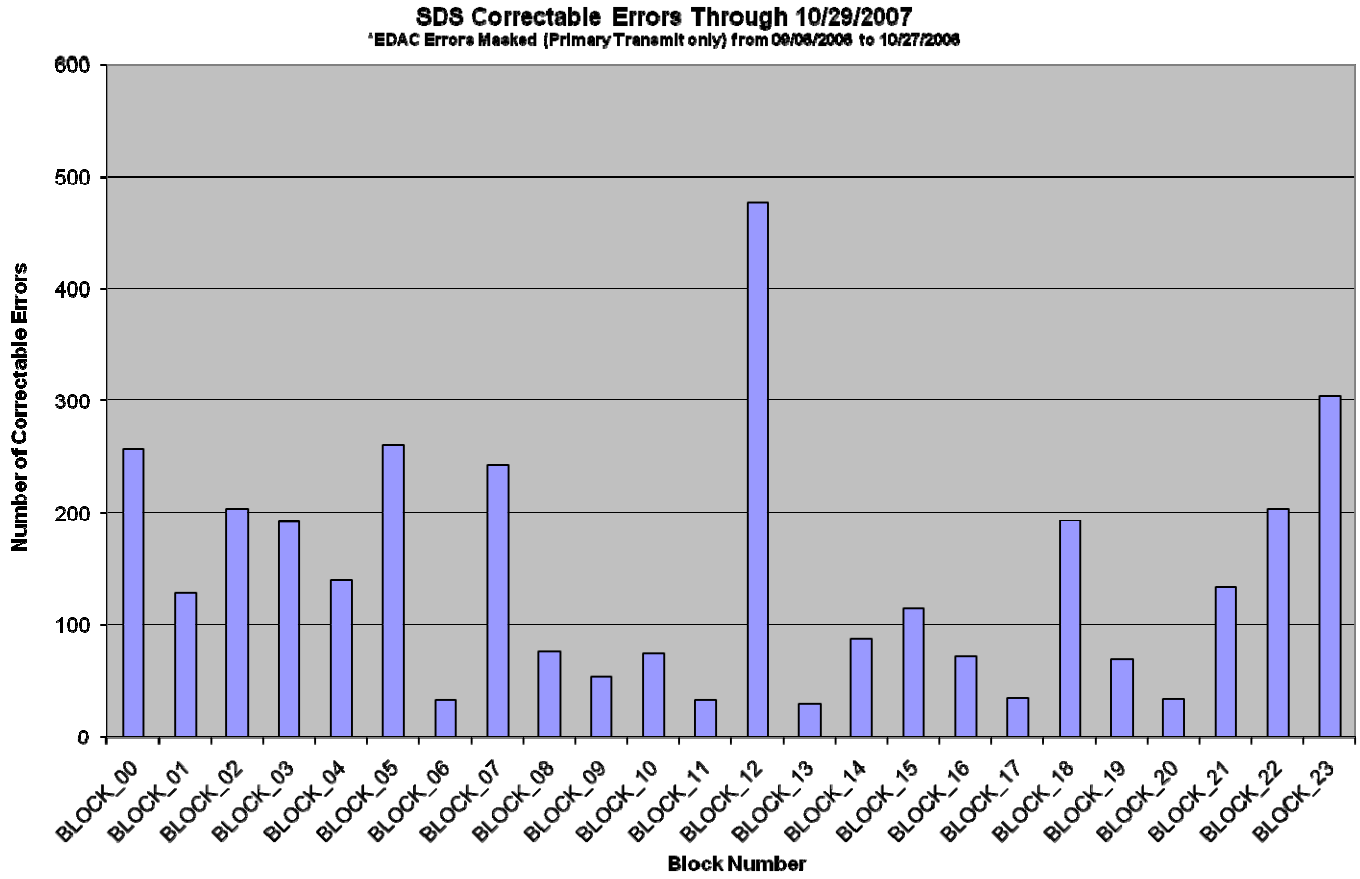




- One Event in the SAA caused 436 Memory Scrubbing Errors

SDS Status (CALOPS0020N)

- All transmits since the interrupt patch have been nominal
- All Blocks are still uncorrectable error free and active



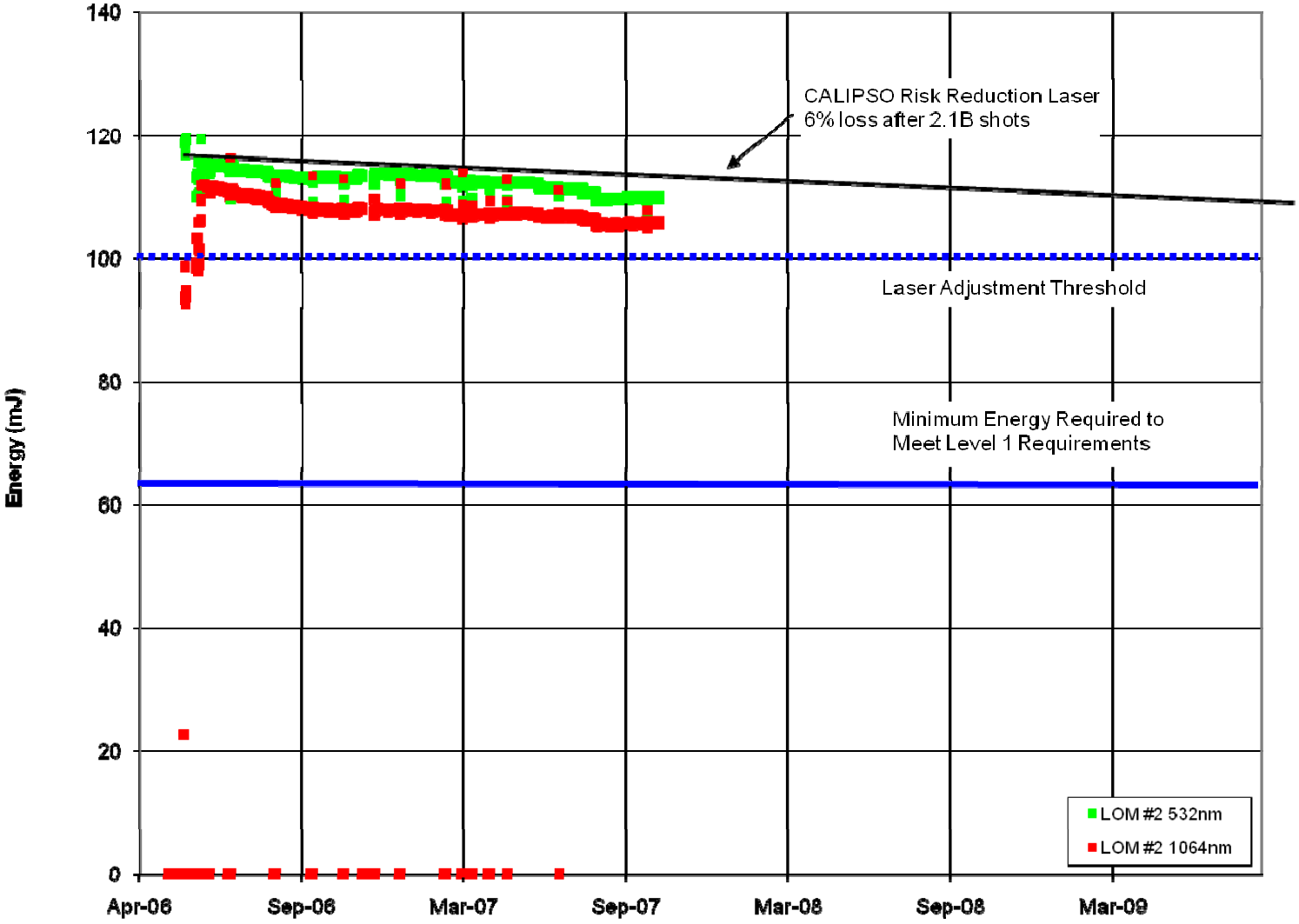
CALIOP LIDAR

SSAI/ Ron Verhappen

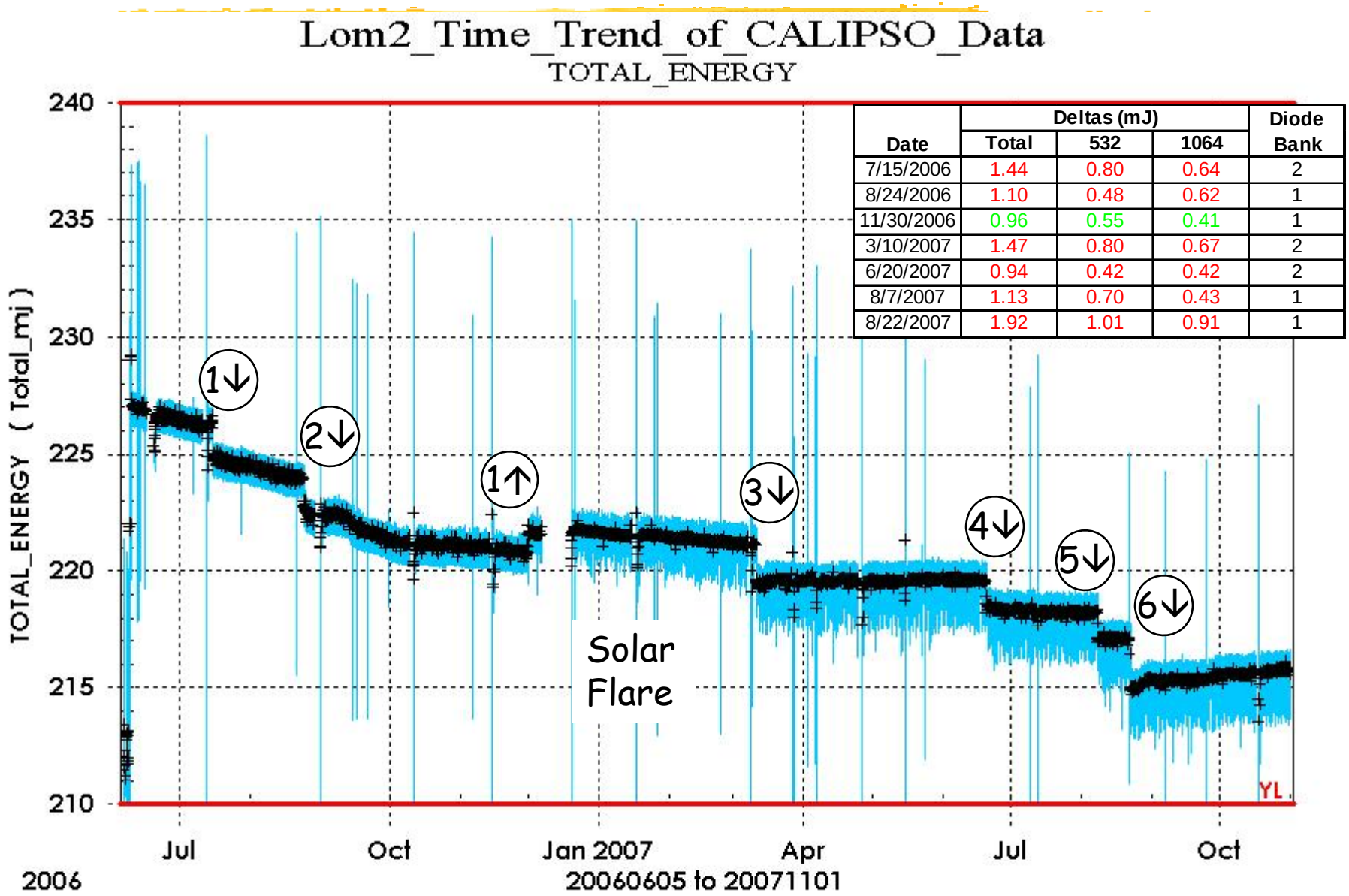
Agenda

- Review Overall Laser Performance
  - Total Energy
  - Energy Balance Trends
  - Thermal Stability
  - Laser Pressure
  - Boresight Trend
- LIDAR Detector Performance
  - Signal Noise
  - Bits Trend
  - Calibrations
- Laser Energy Spikes Investigation Status
  - Discussion of behavior
  - Current Status

Laser Energy Trends



Laser Energy Zoom

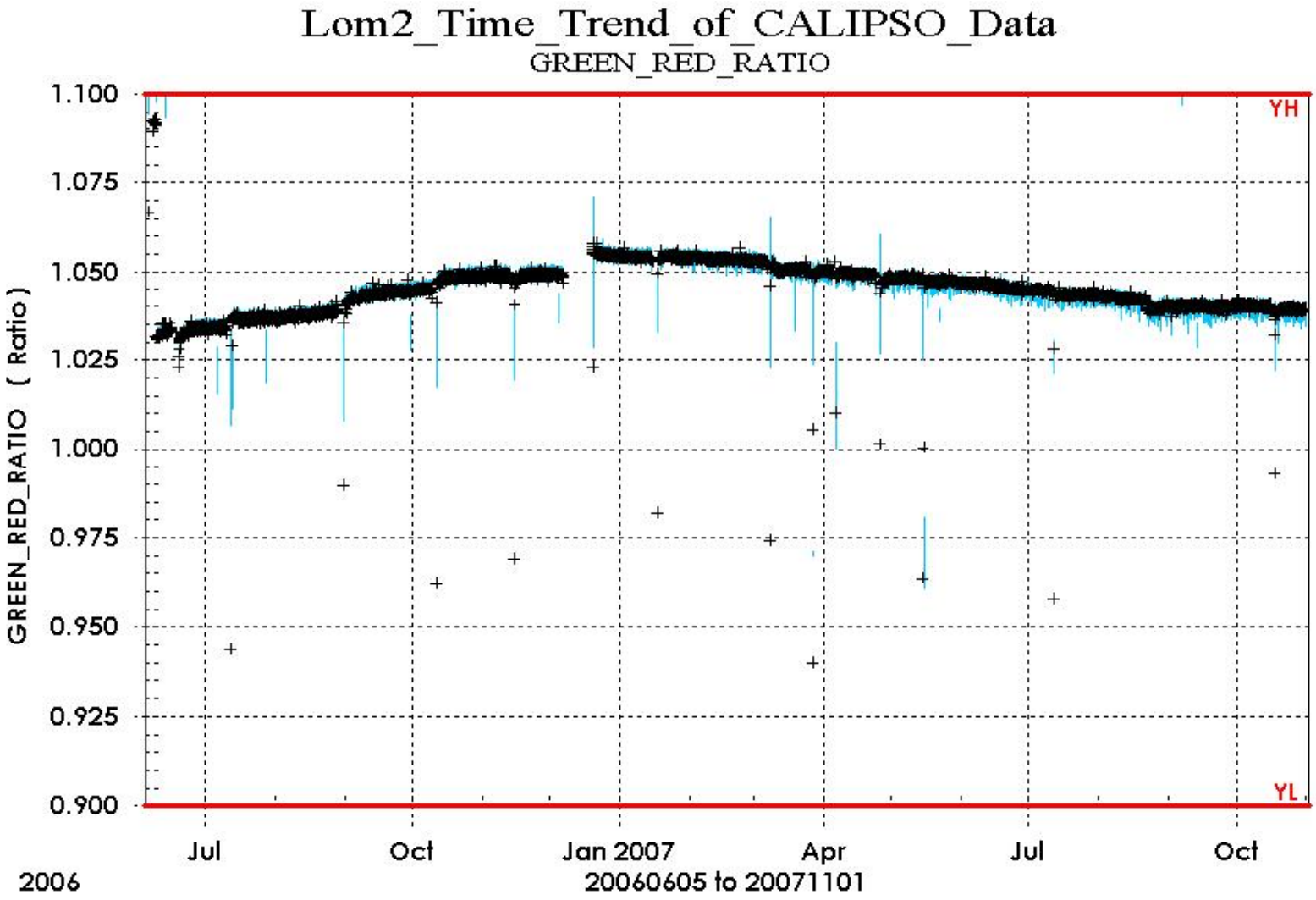


Date	Deltas (mJ)			Diode Bank
	Total	532	1064	
7/15/2006	1.44	0.80	0.64	2
8/24/2006	1.10	0.48	0.62	1
11/30/2006	0.96	0.55	0.41	1
3/10/2007	1.47	0.80	0.67	2
6/20/2007	0.94	0.42	0.42	2
8/7/2007	1.13	0.70	0.43	1
8/22/2007	1.92	1.01	0.91	1

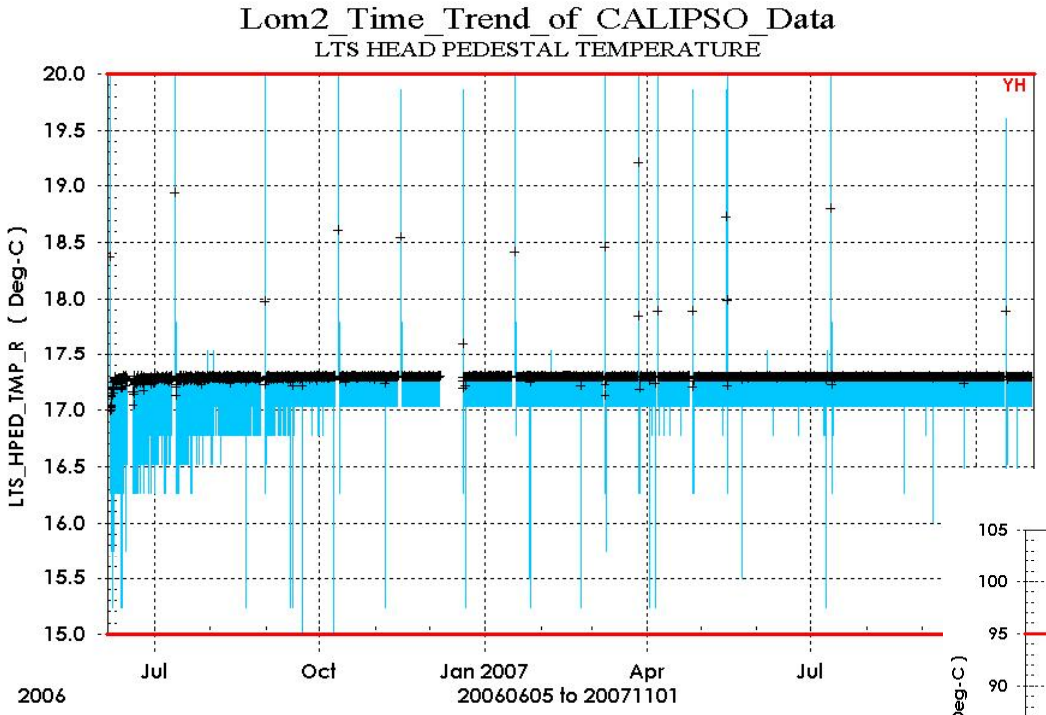
Laser Management Approach

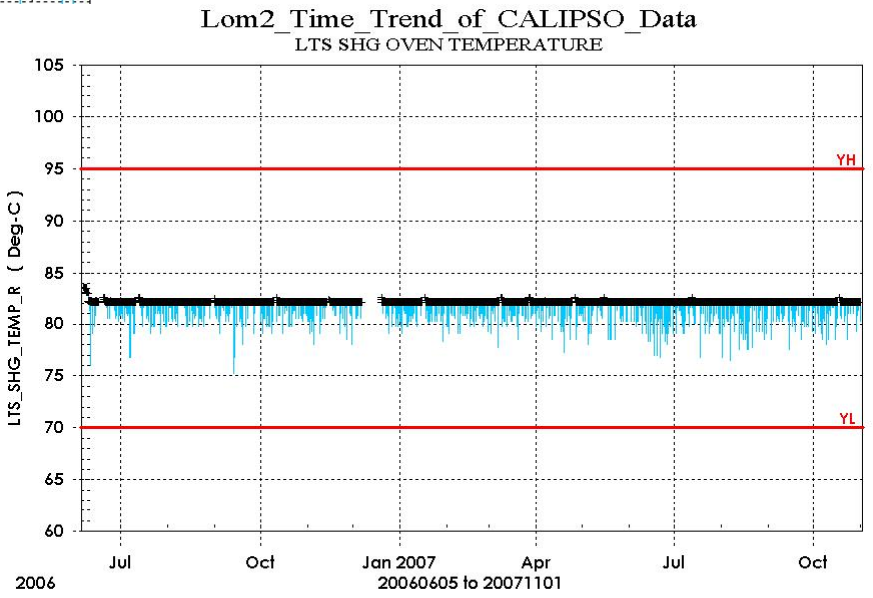
- Quarterly Laser Team Meetings (last meeting September, 2007)
  - Members are experts from NASA, Fibertek and Ball
  - Meeting Results
    - ✓ Laser continues to operate very well
    - ✓ No need to make any adjustments
- Daily Laser Monitoring
  - Output power and thermal parameters
- Weekly Trending of Laser Parameters
  - Laser Pressure
  - Output Power
  - Laser Heater Duty Cycle Trends

Green / Red Ratio



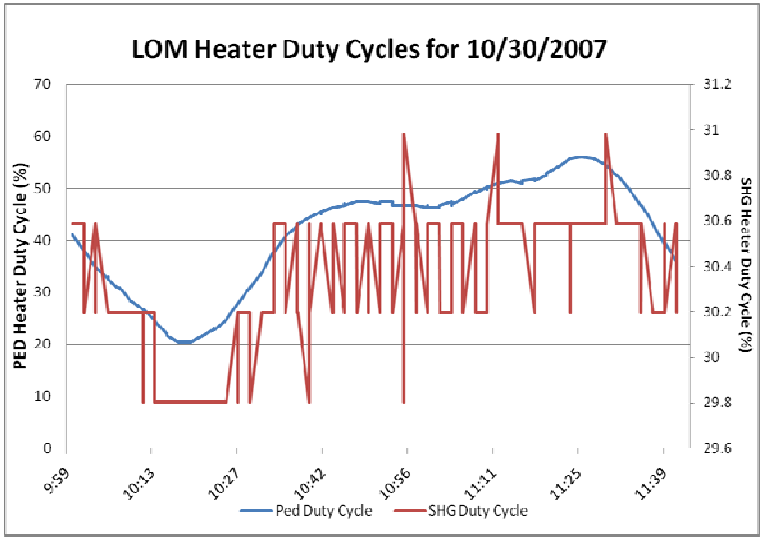
Pedestal @ SHG Temperature Trends

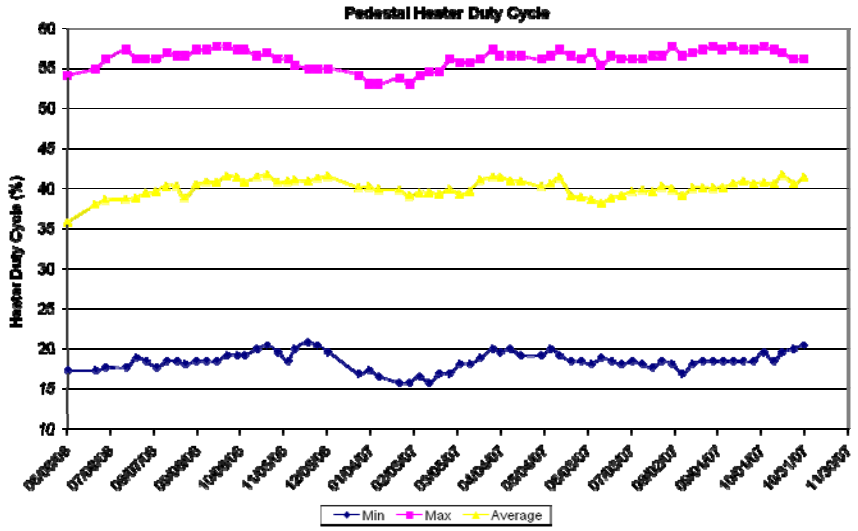


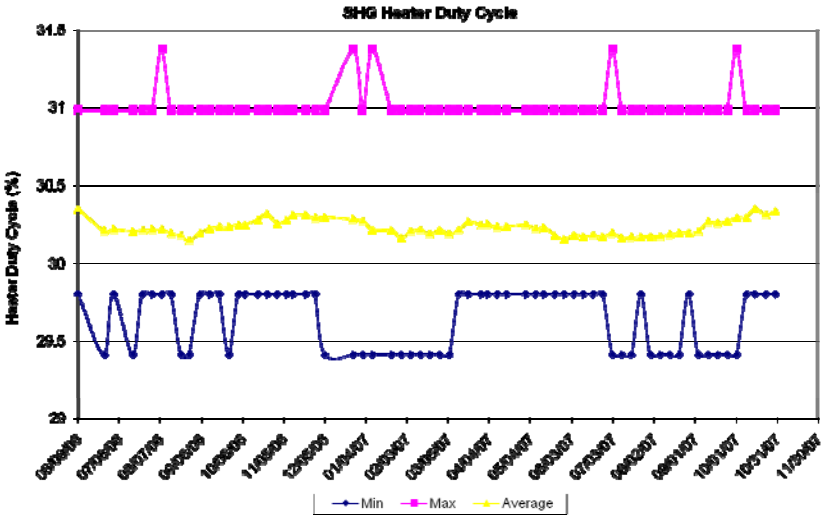


LOM Heater Duty Cycle Trends

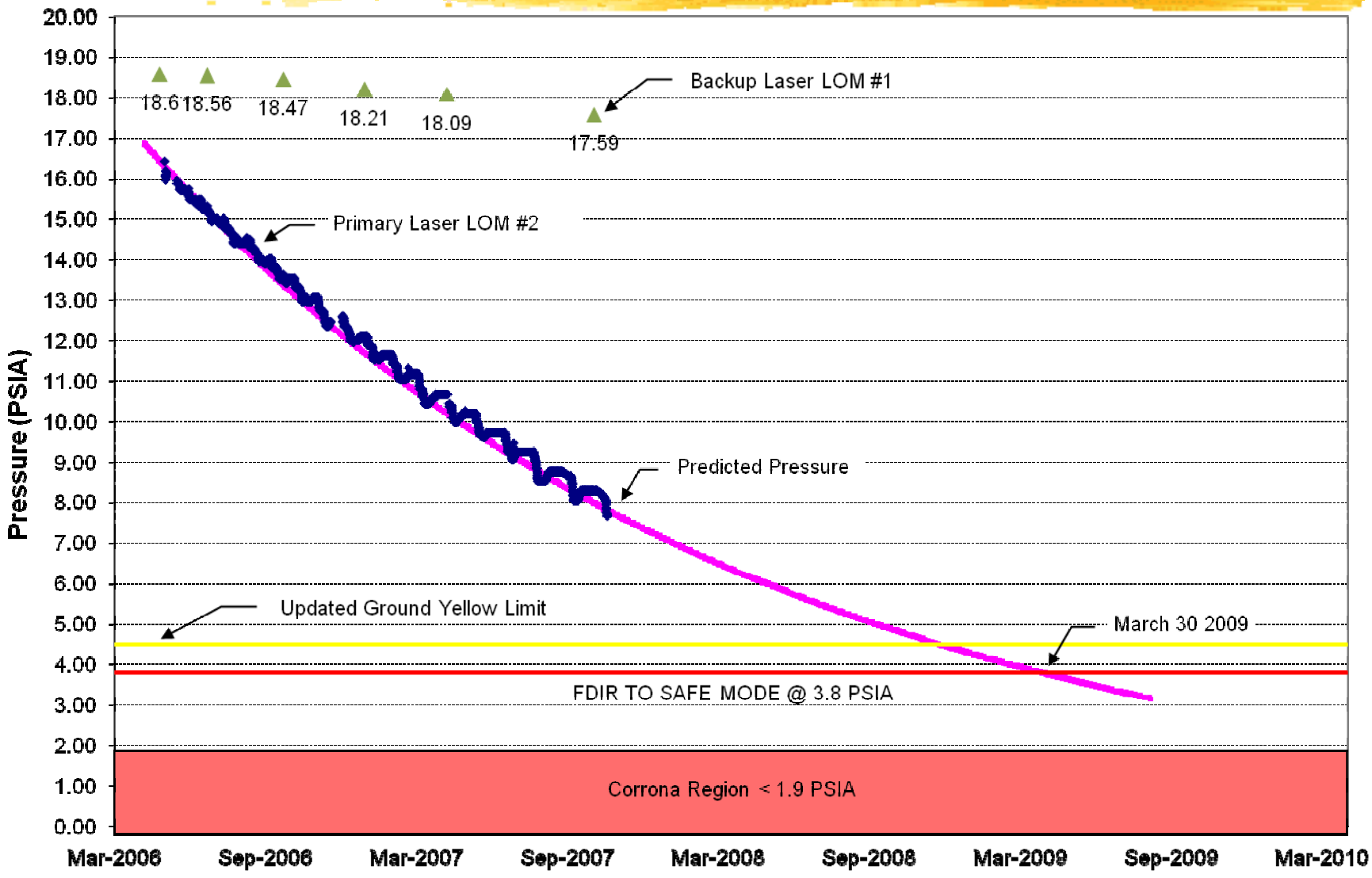
- Data acquired over an entire orbit
  - Conducted Weekly





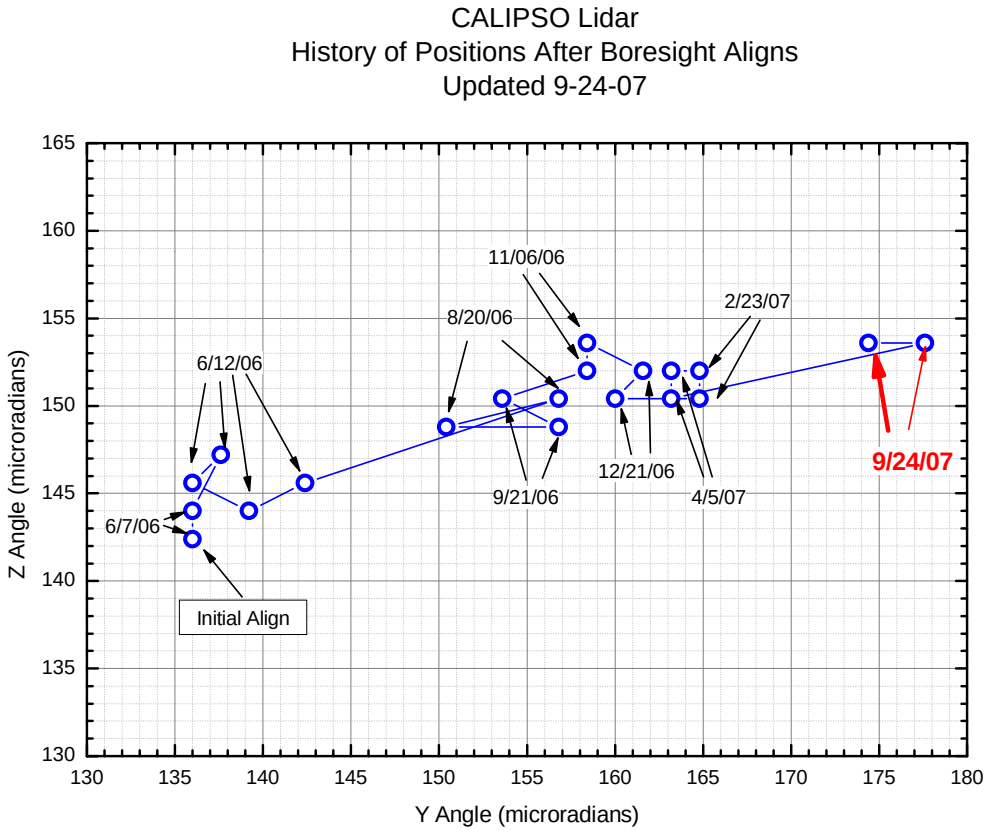


LOM Pressure Trends



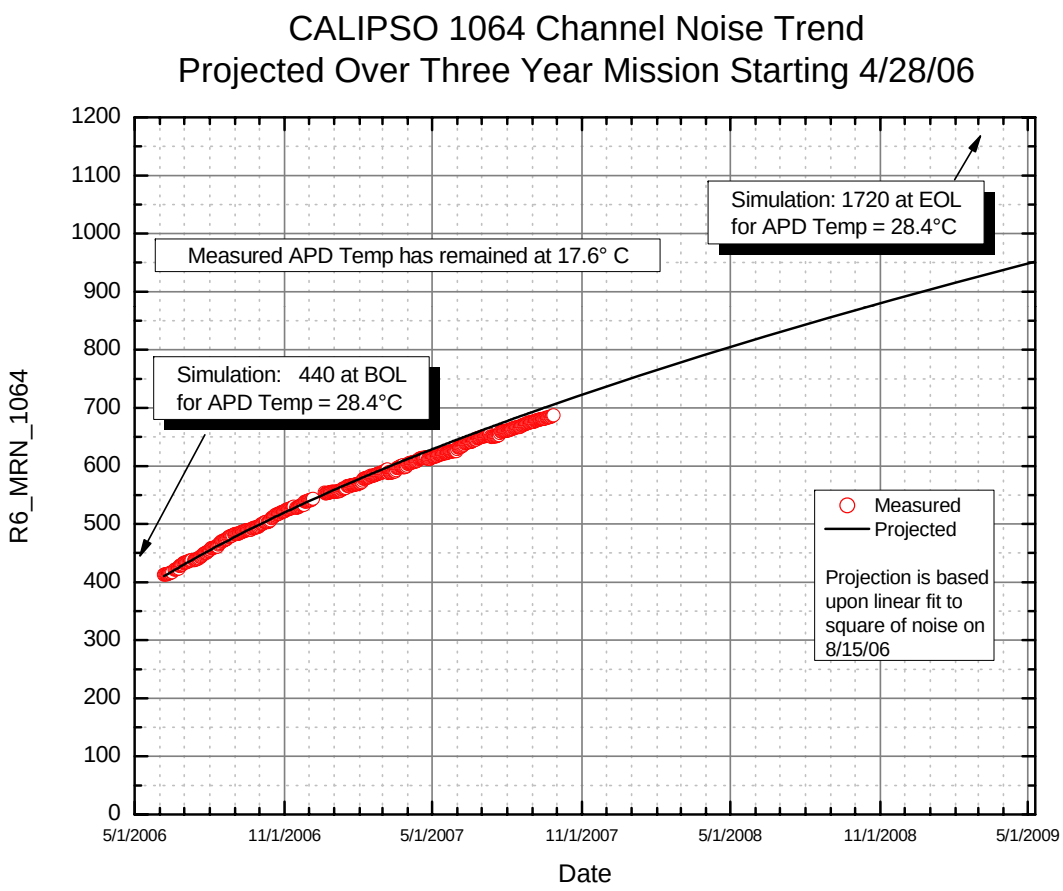
Boresight Trend

- Long Term stability looks good
  - latest alignment shows a slight reversal of the previous trend in aligned positions
- September 24, 2007 Aligns
  - Completed in 2 and 1 iterations
  - Net angular movement of 11.7 microradians
- Investigating Calibration constant stability over an orbit.



1064 Dark Noise Trend

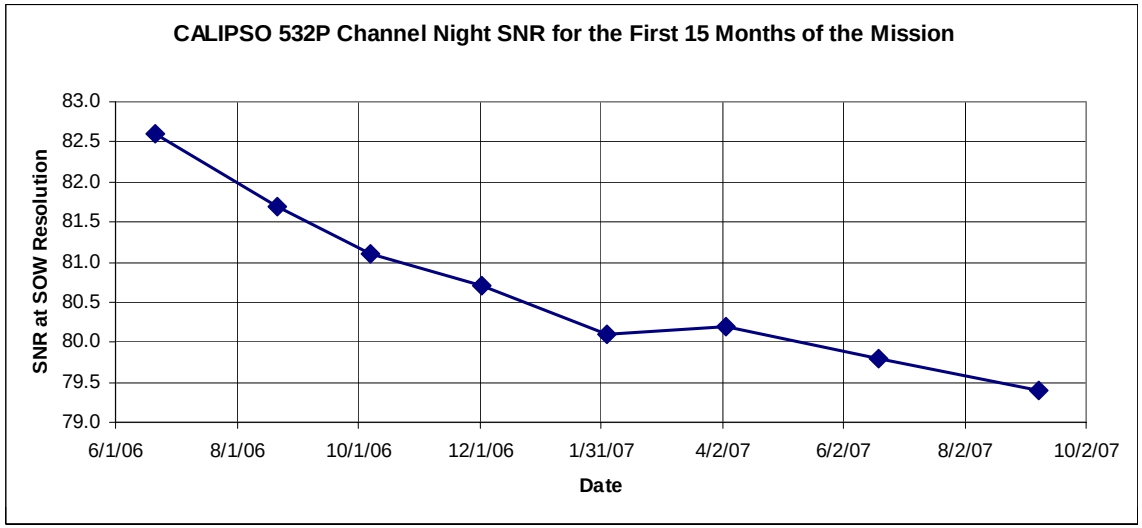
- Trend data is falling slightly below the original trend line.
- Detector is heater controlled to a set point of 17°C
  - No Temperature variations



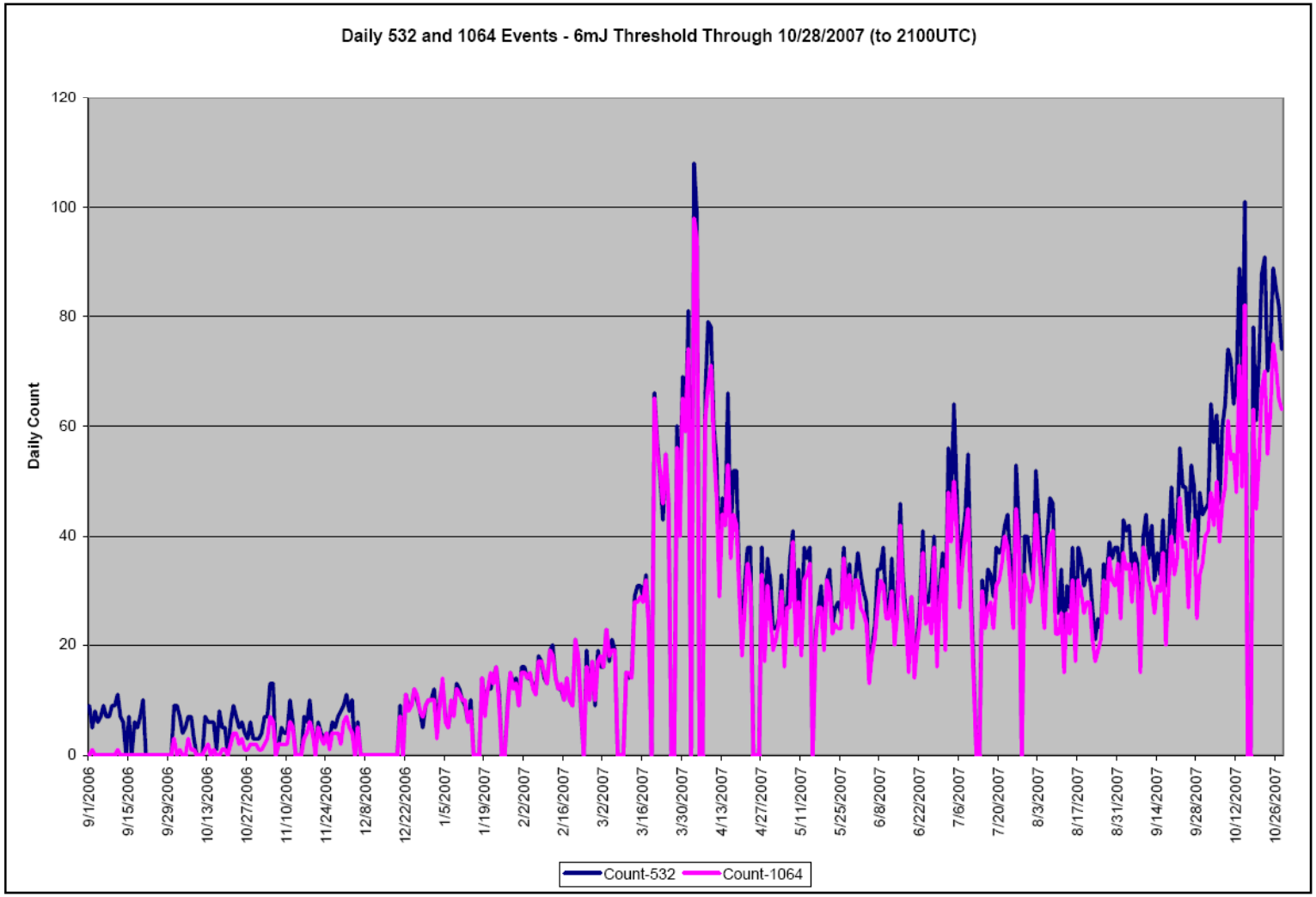
Updated 9/28/07

532 SNR Trend

- SNR remains well over 50%
- Total Drop of 4%
  - Only 2% after normalizing for Laser Energy Drop



Spike Trends



LIDAR Highlights

- CALIOP subsystems have operated for 1.5 year with no adjustments after the initial setup.
  - Laser (Energy loss is expected and understood)
    - ✓ Spikes do not represent a laser health risk
  - Amplifier gains and offsets
  - Detector gains
  - Etalon temperature
- Signal to Noise Ratio is Higher then Expected
- Depolarization performance exceeds requirements
  - < 1% cross-talk
- HST screening conducted MWF
  - Laser operations have been inhibited 11 times

Backup Laser Status

- Laser 2 continues to be the primary Laser
  - The laser will be operated until the internal pressure reaches 3.8 PSIA (Double the Corona pressure)
- Laser 1 Health checks
  - Conducted 6 times to date with nominal results
    - ✓ Next check planned in April '08
    - ✓ Laser powered and placed in standby mode
      - High Voltage applied, but no Diode pumping

Future Plans

- Predictions show that Laser 2 will need to be turned off in the Spring of 2009
  - Transition to laser 1 will require 2 weeks of activity
    - ✓ Thermally Balancing
    - ✓ Energy Balancing
    - ✓ Lidar Tuning
- Detailed planning will begin in Fall of 2008 (REVEX)
  - Schedule of laser activation will need to account for
    - ✓ Team workload and holidays
    - ✓ A-train inclination maneuver execution
    - ✓ Validation campaigns
    - ✓ Technical needs to optimize laser life

Conclusion

CALIPSO Payload performance continues to be outstanding