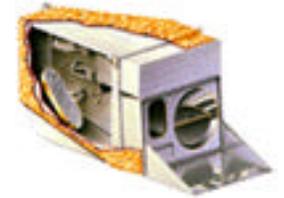# Instrument and L1B Status

MODIS Characterization Support Team

Bill Barnes and Jack Xiong

December 19, 2001

Instrument Status (Terra)
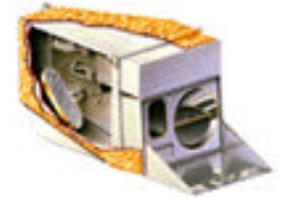
(Dec. 1999 - Jan. 2001)

- Successful safe turn-on, activation, and continuing commanding operations

- Responded to the Rad Cooler anomaly

- Supported resolution of Formatter anomaly

- Successfully transitioned to B-side (10/30)

Instrument Status (Terra)

(Jan. 2001 - Dec. 2001)

- Endured SC SSR anomaly (5% MODIS data loss, 05/20-06/20)

- Supported resolution of PS2 shutdown anomaly (EV data loss, 06/15-07/02)

- B5 electronic gain reduced (04/23 - 06/15, 07/31 -)

- SC inclination maneuver (Nadir door closed / opened, 12/13)

- Instrument is currently operating with A-side electronics (07/02 -)

    - Instrument door movements below the limit
    - SRCA lamp usage below lifetime
    - OBC function well

Instrument Status (Terra)
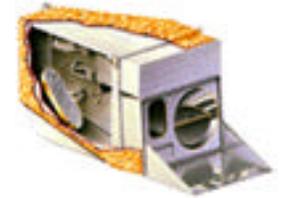
(Jan. 2001 - Dec. 2001)

- Successfully modeled and simulated SDSM ripples

- Determined and corrected SD degradation in RSB calibration

- Developed alternative method for B14H calibration

- Supported MODIS one-year consistent data (re)process

SUMMARY OF KEY MODIS OPERATIONAL CONFIGURATIONS

2000 — days 1–31

February
- Science Data in Earth View Sector
- SW/MWIR Focal Plane Bias
- Temperature Control of Cold Focal Plane
- A-side (Primary)/B-side (Redundant) Electronics

March — various values

April — Inclination Adj

May

June

July

August — Formatter Anomaly and Anomaly Resolution

September

October

November

December

2001

January

2000 operational Configurations

Legend

	Yes	No (Nadir Door Closed or Sensor data not to Recorder)
Science Data in Earth View Sector	Yes (green)	No (red)

SW/MWIR Focal Plane Bias (DN)	110	190	218	226

Temperature Control of Cold FPA	Yes	Partial Loss in orbit	No controlled over entire orbit

A-side /B-side Electronics	A-side	B-side

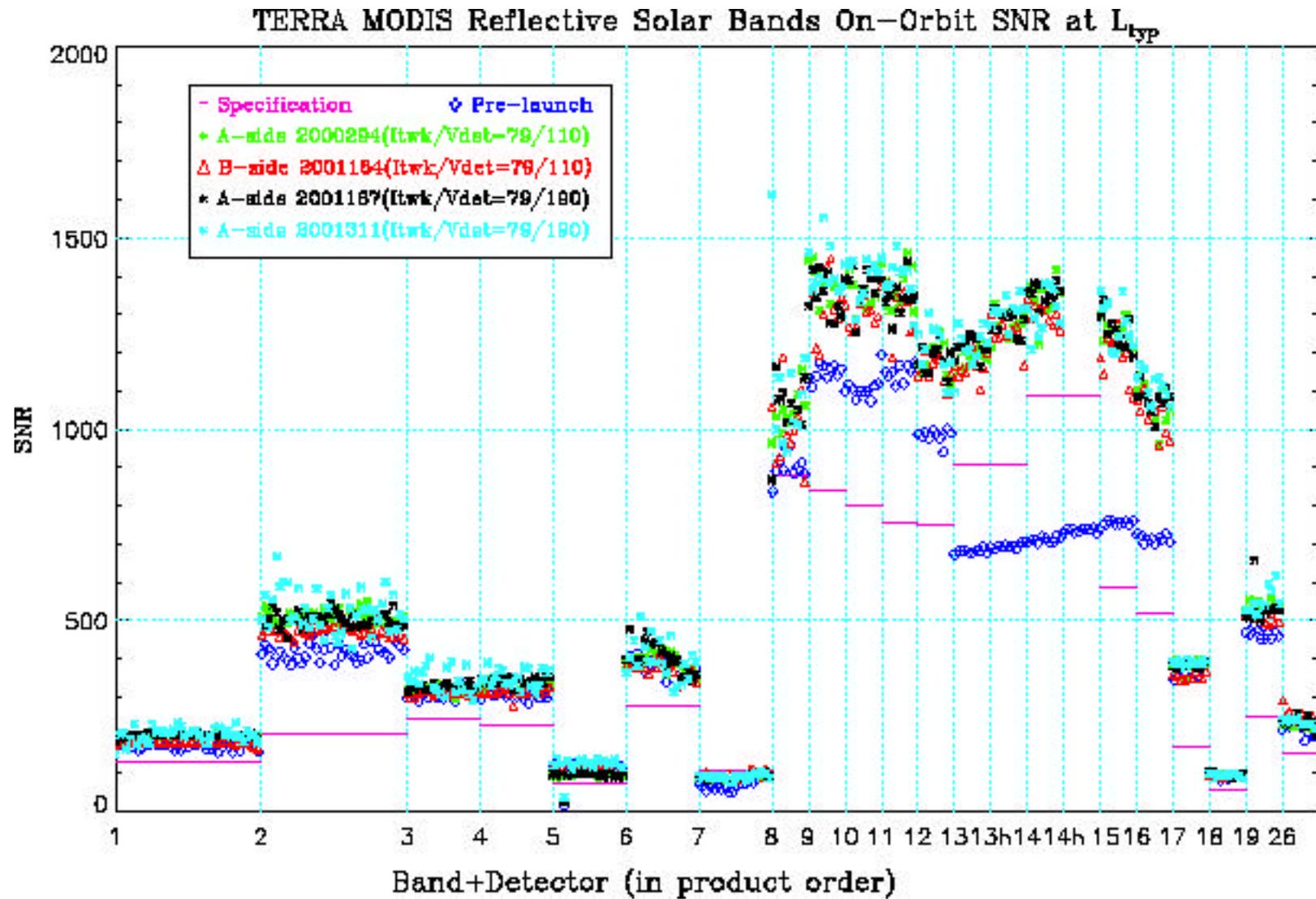| Day 2000174, first formatter reset	Complete cooler outgas, focal plane control returned

SUMMARY OF KEY MODIS OPERATIONAL CONFIGURATIONS

2001 update

2001	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31

January

February

March

April

May

June — Power supply 2 anomaly. MODIS is powered OFF.

July

August

September

october

November

December

Legend

Science Data in Earth View Sector		Yes		No (MODIS is powered OFF)
SW/MWIR Focal Plane Bias (DN)		110		190
Temperature Control of Cold Focal Plane		Yes		Turned off
A-side /B-side Electronics		A-side (PS1)		B-side (PS2)
SSR anonmaly, partial data lost				Power supply 2 anormaly.

RSB SNR Trending

TERRA MODIS Reflective Solar Bands On—Orbit SNR at L_{typ}

TEB NEdT Trending

TERRA MODIS Thermal Emissive Bands On-Orbit NEdT at L_{typ}

Legend:
- Specification
- Pre-launch
- 2001185.2305
- 2001214.0010
- 2001245.2150
- 2001275.2355
- 2001322.1146

Y-axis: NEdT (K)

X-axis: Band+Detector (in product order)
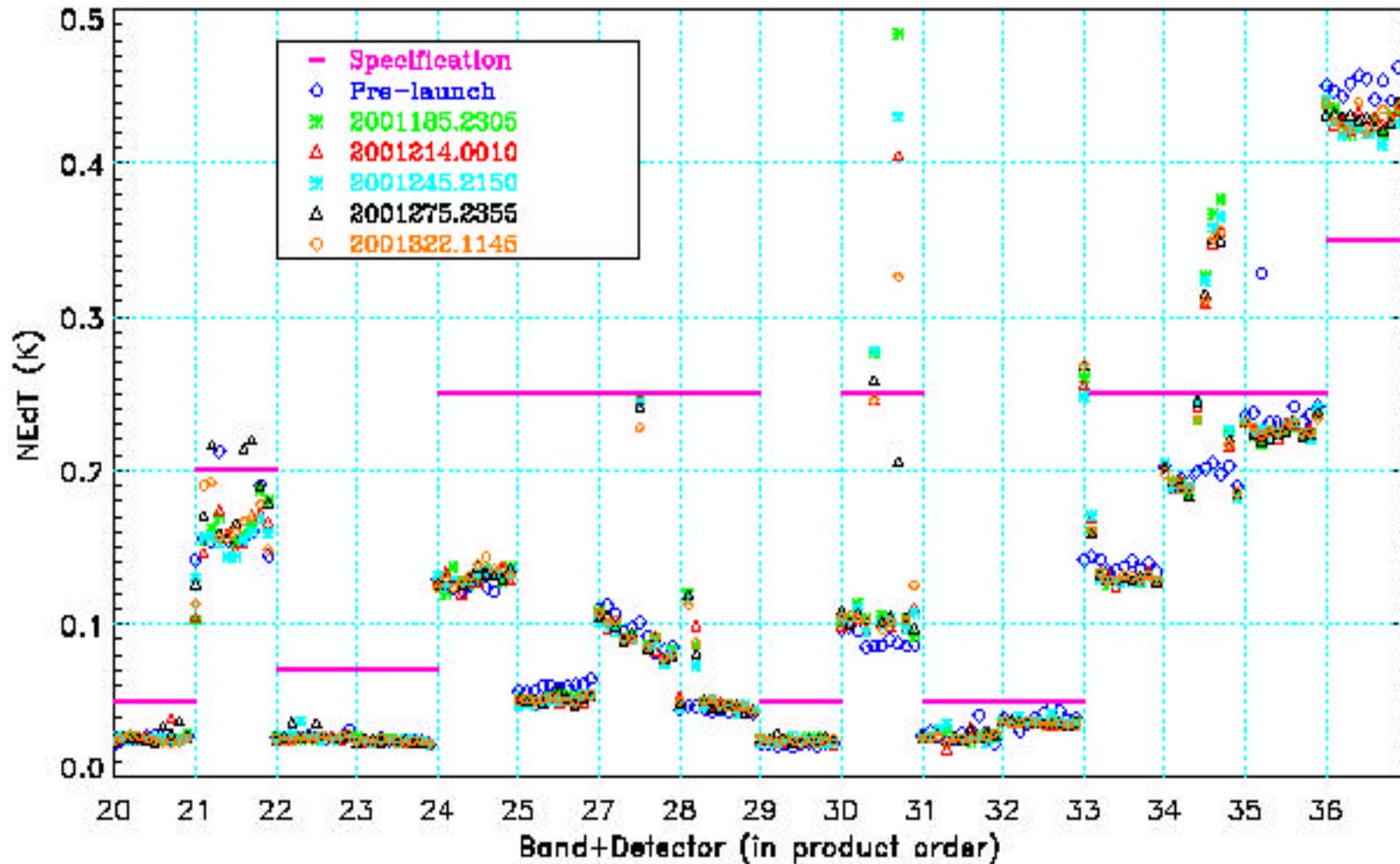
Instrument Status (Terra)

Existing Issues:

- Continue monitoring SD (BRF) degradation

- RVS variation (scan mirror degradation versus AOI)

- Striping

  - Noisy and out-of-family detectors (old and **new**)

- Strategy of reducing SMIR electronics Xtalk effect

- Further improving TEB calibration

ftp://mcstftp.gsfc.nasa.gov/pub/temp/STM_DEC_01/

L1B and LUT Status

L1B Version →

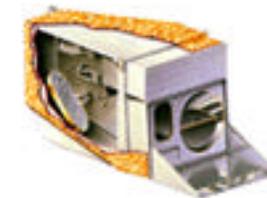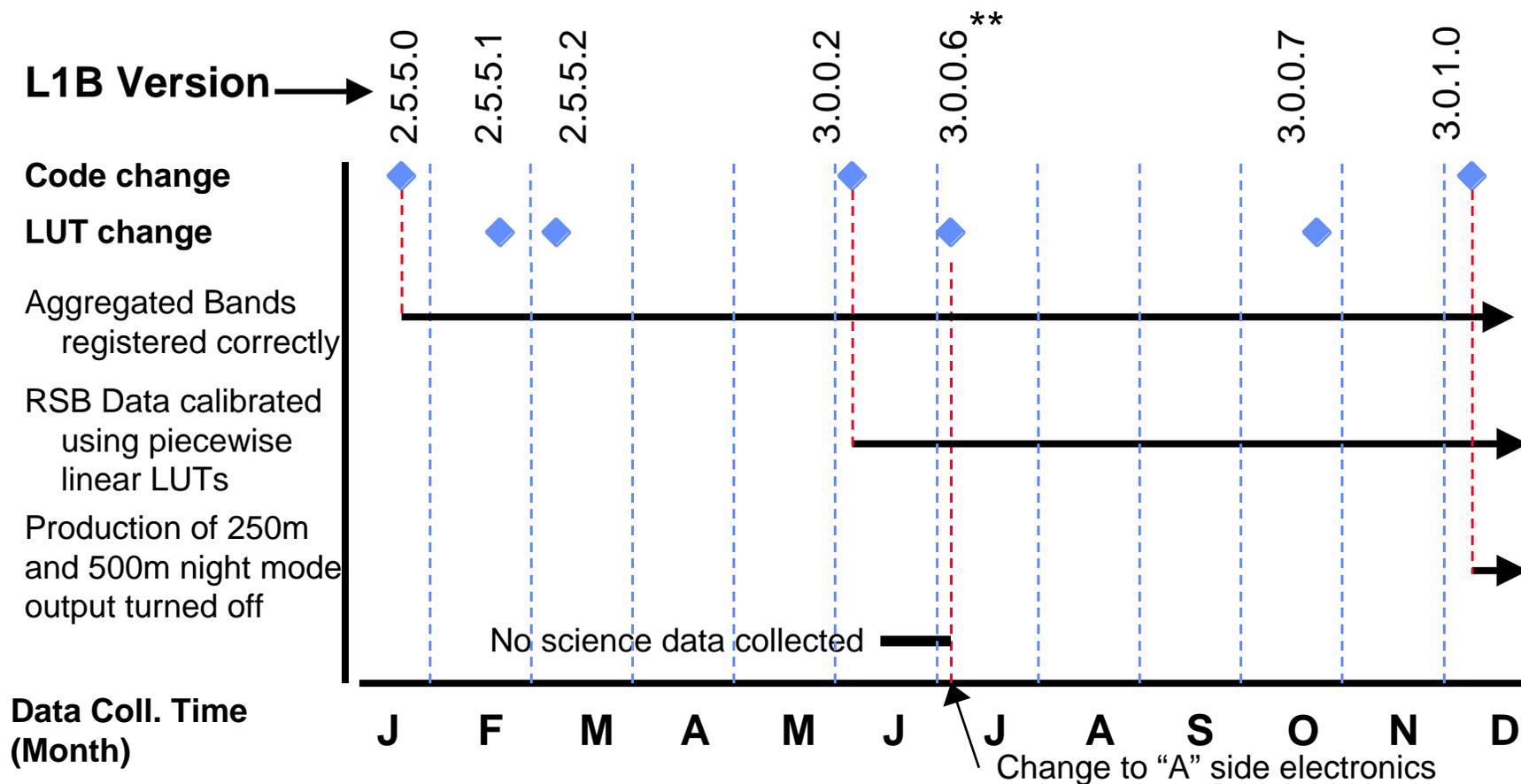| | 2.5.5.0 | 2.5.5.1 | 2.5.5.2 | | 3.0.0.2 | 3.0.0.6 ** | | 3.0.0.7 | 3.0.1.0 |

Code change

LUT change

Aggregated Bands
registered correctly

RSB Data calibrated
using piecewise
linear LUTs

Production of 250m
and 500m night mode
output turned off

No science data collected

**Data Coll. Time
(Month)**

J F M A M J J A S O N D
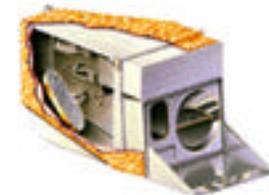
Change to "A" side electronics

* Code Version 3.0.0 was first used with
LUT Version 3.0.0.2.

** LUT Version 3.0.0.6 used for data following
change to "A" side electronics; supercedes earlier
LUT updates.

L1B and LUT Status

http://mcstweb.gsfc.nasa.gov/product.html

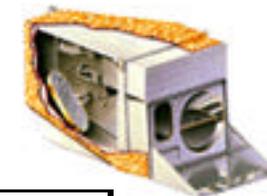| Version # and Date	Version Description
V2.5.5.0_Terra **Major Code & LUT Changes** 1/26/01	**Major Code Changes** * Misregistration of aggregated images corrected. * Detector average of Esun used for computation of band-dependent radiance_scales. **LUT Changes** (No science content affected) * Added Reflective LUT "E_sun_over_pi"; deleted Emissive LUT "Number of overlap scans for temperatures".
V2.5.5.1_Terra 2/13/01	**LUT Update** * 2 detectors marked as non-functioning as of day 2001/019.
V2.5.5.2_Terra 3/2/01	**LUT Update** * Time dependent LUT table pieces added to cover day 2000/063.

L1B and LUT Status

Version # and Date	Version Description
V3.0.0.1_Terra 5/16/01 **Major Code Changes:** (V3.0.0.0 not used in production) **LUT Changes and updates for "B" side electronics and SAFARI time period:**	**Major Code Changes** * Piecewise linear LUT capability added. * Reflective solar bands (RSBs) now check Space View subtracted values for saturation against lookup table. * For SWIR bands, when the moon is in the Space view port, method of computing average background DN same as that used for emissive bands. **LUT Update** * RSB calibration tables changed to type piecewise linear. Many time stamped table pieces added; Reflective LUT "dn_sat_ev" added; Reflective LUT "DN_sat" deleted.
V3.0.0.2_Terra 6/1/01 **LUT Update**	* Emissive calibration tables had time stamped table pieced added. **Update for change to "B" side electronics (day 304/2000):** * Emissive calibration tables: Time stamped table pieces added. * RSB calibration tables: Smoothed table pieces added. * Detector quality flags QA table: Out-of-family gain flag set for 1 detector, days 2000/304 to 2001/019 * Minor changes to "A" side table pieces with time stamps before the SAFARI time period

L1B and LUT Status

Version # and Date	Version Description
V3.0.0.4_Terra 8/1/01	**Update for change to "A" side electronics (day 183/2001):** *** Emissive and RSB Calibration tables: Time stamped table pieces added.** *** Detector quality flags QA table updated** *** SWIR out-of-band correction switch turned OFF**
V3.0.0.5_Terra 8/16/01	**RSB LUT update for Band 5 gain change (day 212/2001):** *** Time stamped table pieces added to RSB calibration tables.**
V3.0.0.6_Terra 9/6/01	**CURRENTLY IN USE BY THE DAAC FOR FORWARD PROCESSING** **Update for SWIR OOB correction on "A" side (after day 183/2001):** *** SWIR OOB correction switch turned ON.** *** New SWIR OOB correction table piece added.** *** RSB calibration table pieces reworked for SWIR OOB correction.**
V3.0.0.7_Terra 10/26/01	**Update to Detector Quality Flags after return to "A" side electronics:** *** Detector quality flags QA table: Out-of-family gain flag set for 2 detectors; noisy detector flag set for one detector as of day 183 2001.**
V3.0.1.0_Terra **Minor code changes:** 12/11/01	**NO CHANGE TO SCIENTIFIC CONTENT OF OUTPUT.** **Browse code updated at same time.** *** Check on leading/trailing granule times inserted. If granule does not immediately precede/follow middle granule respectively, it is not used for emissive calibration.** *** Ability to turn off production of 250m and 500m output files when instrument is in "night" mode added.**

MODIS STM, December 19, 2001

Instrument Status (Aqua)

- **Aqua MODIS (FM1)**
  - Thermal vacuum calibration at SBRS finished (Aug. 1999)
  - Spacecraft TV test at TRW finished (Oct. 2001)
  - Pre-launch calibration workshop on December 17, 2001
  - Launch date (TBD)

ftp://mcstftp.gsfc.nasa.gov/pub/temp/STM_DEC_01/

Instrument Status (Aqua)

Improvements:

- TEB RSR measured in TV

- TEB system level RVS measurement

- PC optical leak FM1 << PFM

- SWIR thermal (5.3 micron) leak FM1 < PFM

- SMIR electronic crosstalk and sub-frame difference FM1 < PFM

- B31/B32 gain change for SST improvement (new T_sat is about 340K)

Instrument Status (Aqua)

Concerns:

- T_sat for B33, B35, and B36 (below 310K)
- B5/B6 detector operability
- BBR

- L1B algorithm modifications needed (minor)