

VIIRS SDR Status Summary

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VIIRS SDR Provisional Status

- Oct. 23, 2012: Suomi NPP SDR Product Provisional Status Review held at NOAA Center for Weather and Climate Prediction, College Park, Maryland
- As of early Jan. 2013, still preparing VIIRS SDR for Provisional approval by the AERB





VIIRS SDR Issues and Challenges



RTA degradation

- RTA degradation anomaly challenges the VIIRS SDR team to maintain RSB calibration uncertainty and stability within requirements.
- Ongoing RTA degradation is modulating VIIRS VNIR and SWIR RSR.

Operational processing:

- Incorrect solar irradiance model used which affects radiance accuracy (reflectance less affected if done properly)
- Uncertainties/errors in IDPS processing software/code may still exist
- Automated calibration for the solar bands to be implemented soon

DNB Straylight Correction

(implementation in the operations)

VIIRS Petulant mode:

- SC Counter overflow anomaly & SBC anomaly (1394)
- Scan Sync Loss
- Effects switching to the A-side in Nov. 2012 (geolocation correction)

Other

VIIRS bias relative to CrIS

Early VIIRS SDR data and reprocessing

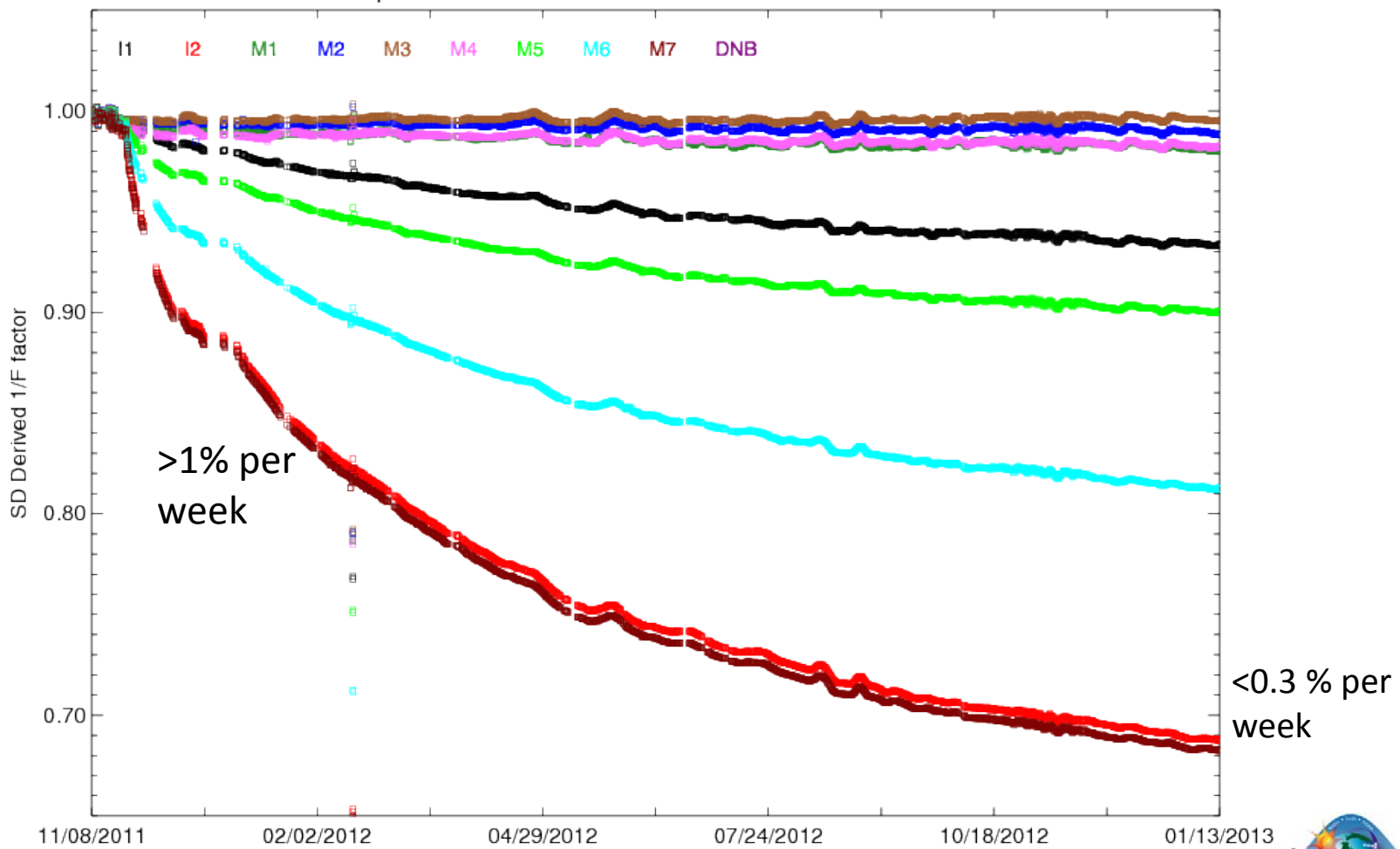
OBC-BB Thermister anomaly

SDSM Spectral Leak



RTA Mirror Slower Degradation

NPP VIIRS SD VisNirBands A Trend F Factor
Updated at Mon Jan 14 09:35:24 2013 UTC





VIIRS Event Log Database

<https://cs.star.nesdis.noaa.gov/NCC/VIIRS>

| | | | | |
|----|---|---------------------|---------------------|---------|
| 40 | Roll maneuver , orbit 2235, VIIRS was carrying out a sector rotation (encoder offset) activity. Moon at 23:05:11z (22:59-23:13z) | 2012-04-02 00:00:00 | | 92 |
| 41 | MX5.3 implemented. Should fix the M13 dual gain problem. Start at 18:21 UTC | 2012-04-02 18:21:00 | | 92 |
| 42 | NPP Roll Maneuver (With Sector Rotation) | 2012-04-02 22:59:00 | 2012-04-02 23:13:00 | 093 |
| 43 | No LUT update due to artifacts in Spacecraft Control Computer lock up anomaly (previously known as 1394 anomaly) | 2012-04-03 00:00:00 | | 93 |
| 44 | VIIRS SDR Review held at WWB in Camp Springs | 2012-04-05 00:00:00 | | 95 |
| 45 | VIIRS SDR Beta Status CCR package submitted to DPA | 2012-04-11 00:00:00 | | 101 |
| 46 | VIIRS SDR/EDR Workshop at GreenTech and GSFC | 2012-04-17 00:00:00 | | 107 |
| 47 | NPP Roll Maneuver (With Sector Rotation) | 2012-05-02 10:15:00 | 2012-05-02 10:27:00 | 123 |
| 48 | VIIRS OBC Warm-Up Cool-Down | 2012-05-22 12:34:00 | 2012-05-25 15:00:00 | 143-146 |
| 49 | NPP Lunar Cal. (No Roll, with Sector Rotation) | 2012-05-31 14:47:00 | 2012-05-31 14:50:00 | 152 |
| 50 | NPP SC Anomaly - SDP trip to Earth Point Mode | 2012-06-21 18:00:00 | 2012-06-22 14:43:00 | 173 |
| 51 | VIIRS 3rd OBC Warm-up Cool-Down | 2012-09-10 06:00:00 | 2012-09-12 03:00:00 | 253 |
| 52 | Suomi NPP SDR Product Provisional Status Review, NOAA Center for Weather and Climate Prediction, College Park, Maryland | 2012-10-23 00:00:00 | 2012-10-24 00:00:23 | 296 |
| 53 | VIIRS 1394 Anomaly (petulant mode) | 2012-11-22 16:32:00 | 2012-11-23 01:26:00 | 326 |
| 54 | VIIRS A/B Side Switch: geolocation accuracy degraded (nadir geolocation bias of ~325 m in the scan direction) until LUT update on December 11, 2012 | 2012-11-22 22:07:00 | 2012-12-11 19:18:00 | 326 |
| 55 | VIIRS Emissive Band Calibration Blackbody Warm-up Cool-down | 2012-12-17 06:00:00 | 2012-12-19 04:00:00 | 364 |
| 56 | NPP Lunar Roll Maneuver and VIIRS sector rotation 12/23 orbit 5990 | 2012-12-23 14:55:20 | 2012-12-23 15:08:21 | 357 |

Complements the performance monitoring at:

http://www.star.nesdis.noaa.gov/icvs/NPP/ipm_telemetry_npp_viirs.php



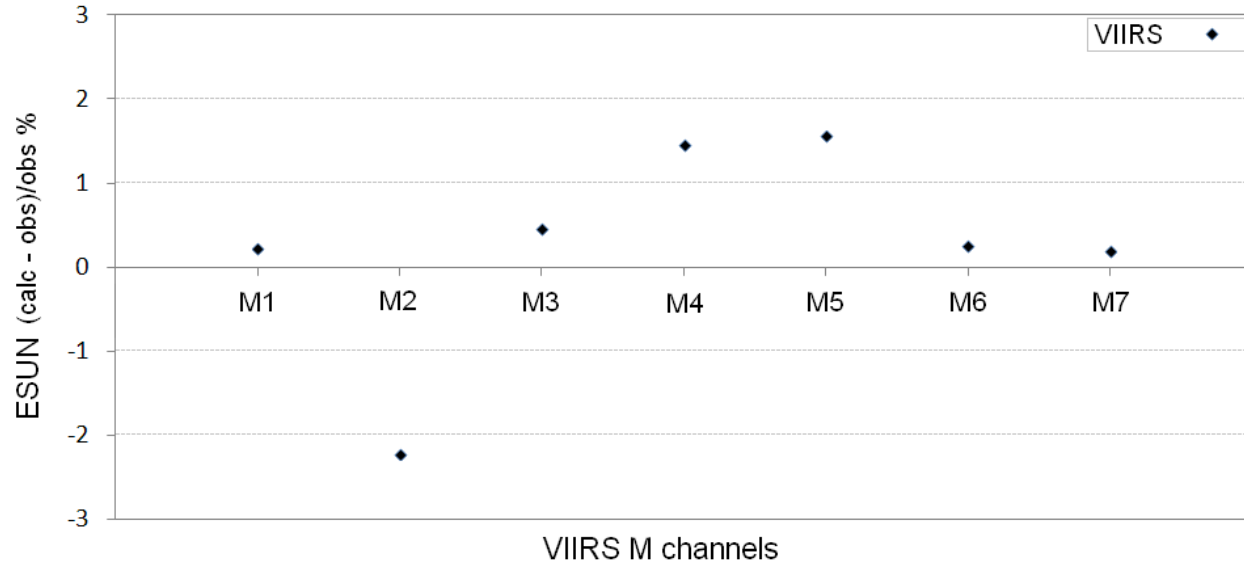
Solar Irradiance Discrepancy

VIIRS Esun in the operations are different from independent calculations

Discrepancy was found to be due to the use of Modtran solar irradiance instead of the Thuillier 2002 as documented

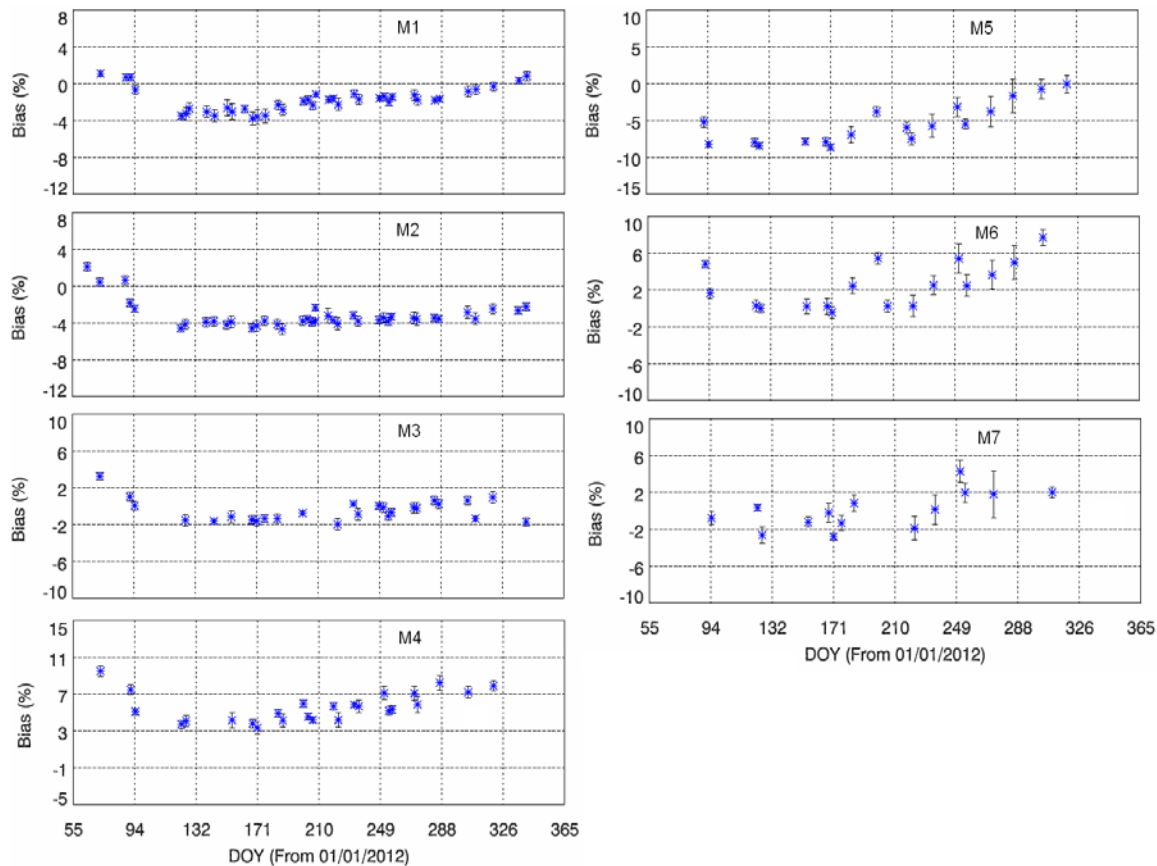
Impact on users: not significant if using reflectance and converted consistently

Radiance would be off when compared with other instruments.



VIIRS/MODIS Radiometric Bias

- Bias closely monitored at the SNOs in the low latitudes, as well as high latitudes
- Also monitored at desert sites and Antarctic
- Root cause of biases are investigated



Radiometric bias ((VIIRS-MODIS)/MODIS*100%) time series of VIIRS bands M-1 through M-7 over ocean



Geolocation update

- VIIRS “Petulant mode” on Nov. 22, 2012. Scan control electronics switched from side B to A when power restored.
- Geolocoation LUT contained incorrect parameters with estimated ~325 meter in scan direction
- The correct LUT applied starting Dec. 11, 2012.
- Geolocatin accuracy restored



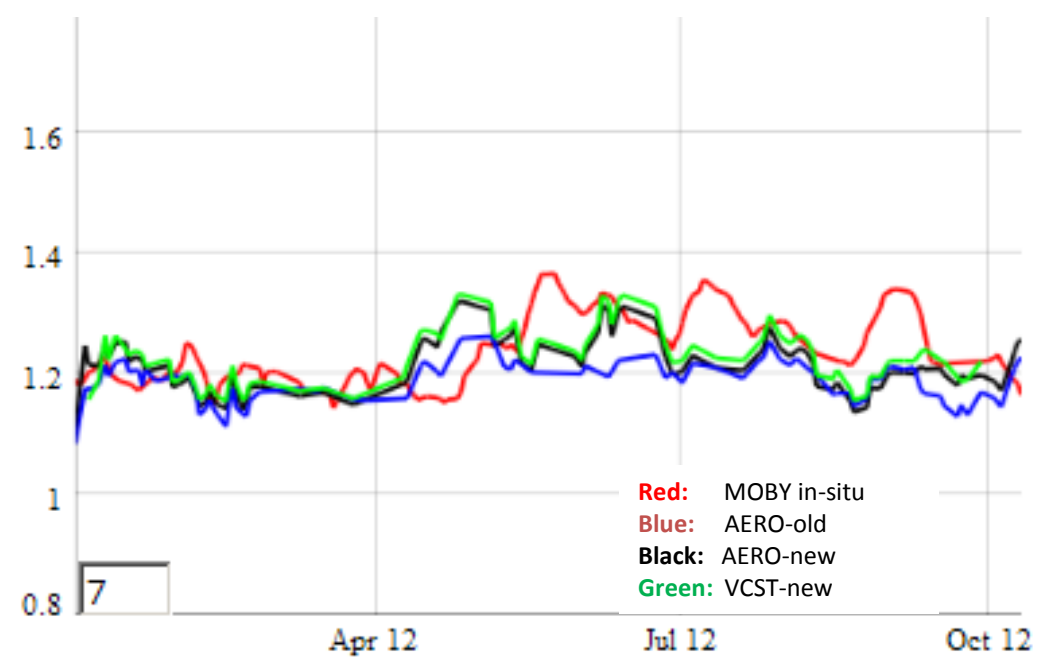


Ocean Color issues

Working closely with ocean color EDR team to assess different look up tables

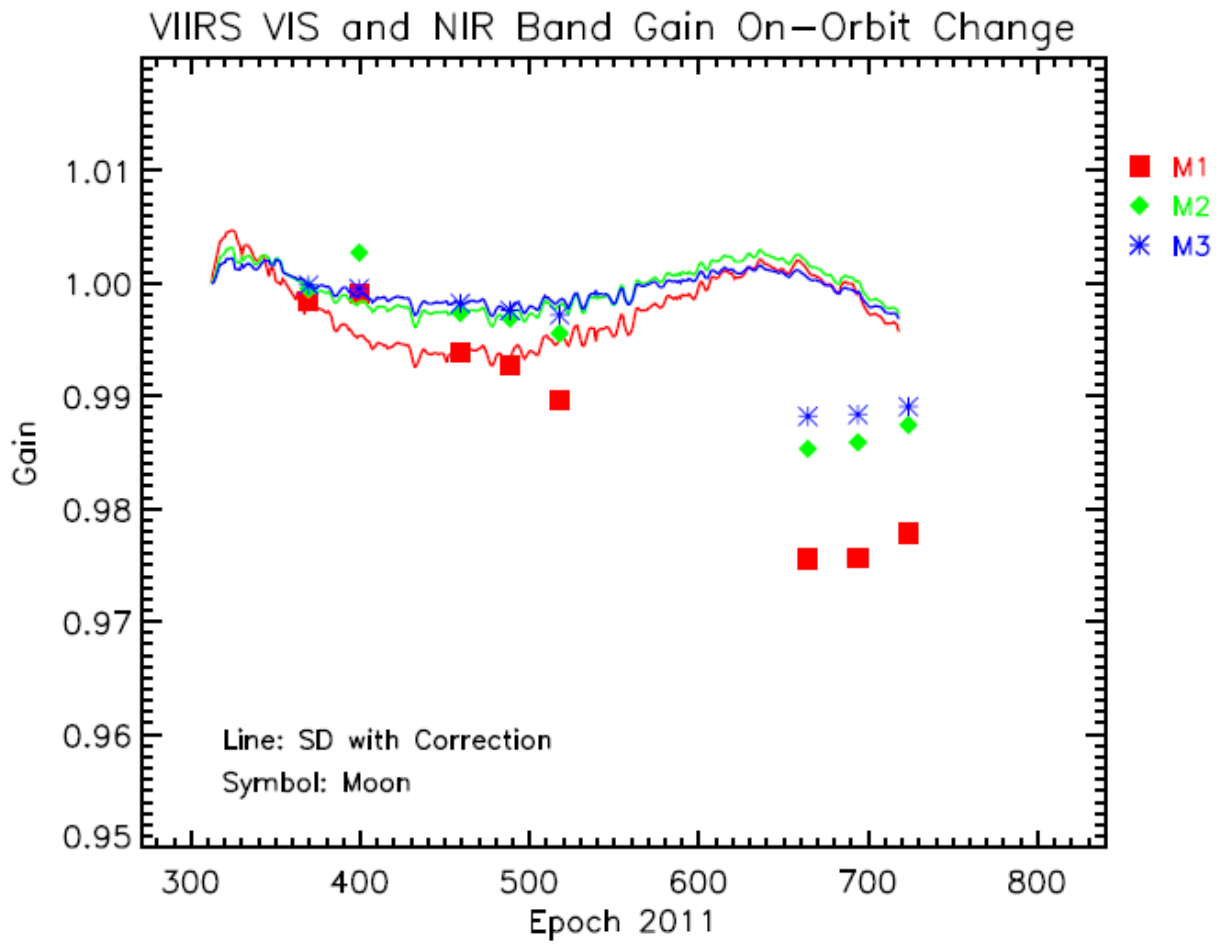
Comparison with MOBY data

MOBY Site OCC EDR Water-Leaving Radiance (486 nm)

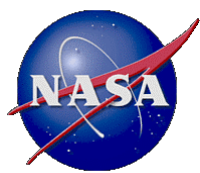


VIIRS Lunar Calibration

- Discrepancies observed between Lunar and Solar difuser calibration
- VCST is investigating the root cause



Courtesy of NASA-VCST



VIIRS early on-orbit performance and documentation

- TGRS paper submitted, with many corrections in parameters (ATBD has incorrect values)
 - Cao, C., F. Deluccia, X. Xiong, R. Wolfe, and F. Weng, Early On-orbit Performance of the Visible Infrared Imaging Radiometer Suite (VIIRS) onboard the Suomi National Polar-orbiting Partnership (S-NPP) Satellite, submitted to TGARS
- VIIRS SDR user's guide is being updated with the latest information (especially in the geolocation section)
- More publications are in preparation

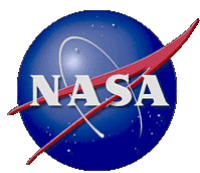




Other issues

- VIIRS comparison with CrIS and IASI
- Striping
- Automated calibration for the RSB
- DNB straylight correction
- Casa/Nosa Access





Summary

- VIIRS SDR quality is very good
- Issues closely tracked:
 - RTA mirror degradation
 - Event tracking and performance monitoring
 - Discrepancies in calibration parameters
 - Geolocation accuracy
 - Radiometric biases
- Working closely with EDR teams to address calibration issues

