

Visible Infrared Imaging Radiometer Suite

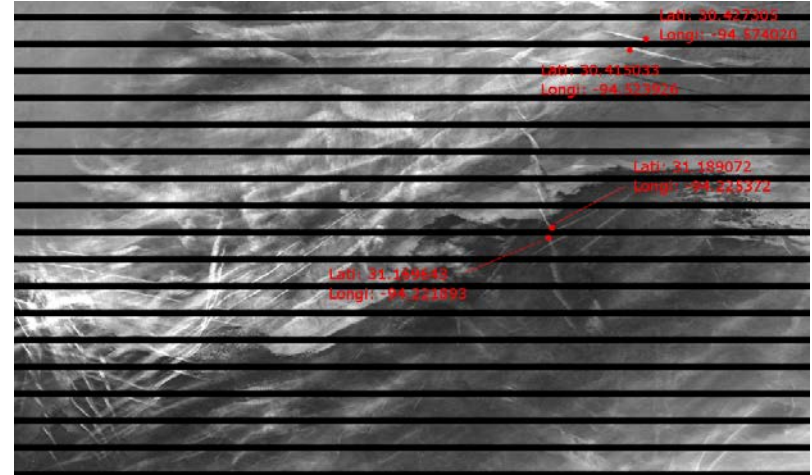
VIIRS SDR Session Summary

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NOAA Center for Weather and Climate Prediction (NCWCP)
5830 University Research Park, College Park, Maryland
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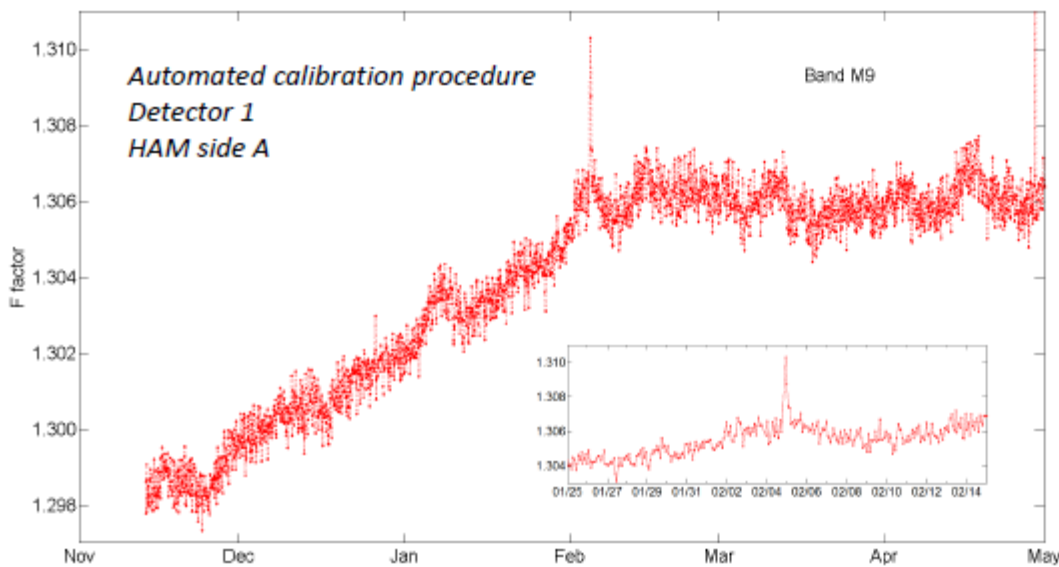
- Overall, the VIIRS instrument continues to perform well, meeting performance specifications
- TEB summary:
 - SST striping continues to be an issue that require further investigation. Effects due to detector vs. band average level RSR analyzed. Results show that M13 NEDT at blackbody is 0.04K while noise can be upto 0.15K due to striping, half of which due to band average RSR effects.
 - Action: Further test the striping effect due to RSR averaging in the algorithms.
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 - CO adjustment can reduce the M15 bias but the benefit is marginal given the uncertainties with IASI/AIRS/CrIS consistency at low temperatures (Moeller)
 - “mis-alignments” between scans reported by SST in the bow-tie region. A quick analysis using contrails does confirm the effect (upto 5km displacement found between scans).
 - Action: Further investigation using ground linear features needed because contrails are at much high altitudes.
- DNB summary:
 - Straylight correction works well according to users.
 - Improvements and changes in calibration need to be well documented and made available to the public on-line.
 - Action: Enhance the VIIRS Event Log database to keep track of all changes. Add commentary on anomalies to facilitate reanalysis. Currently the database covers a large number of events but not completely.

Alignment check using contrail (I4-I5)



- RSB calibration
- H-factor discrepancies between the operational and other versions may cause problems in the F factor trends.
- Recent flattening in the F-factor trend requires further investigation
- Validations at vicarious sites, DCC, and comparisons with MODIS may confirm the discrepancies observed by ocean color groups
- **Actions:**
 - A) further investigate the root cause for the flattening trend in the F-factors
 - B) Prepare for early transition to RSB autocal to mitigate the recent calibration issues
- J1 Polarization issues
 - Good progress has been made in planning for additional prelaunch characterization, modeling, global observations using GOME, and ground based measurements
 - Uncertainty in the polarization phase is a concern (BG)
- **Actions:**
 - A) Provide feedback to NASA on the phase uncertainty concerns to see whether it can be improved for J1/J2
 - B) Endorse the current effort to support the polarization studies for J1 VIIRS

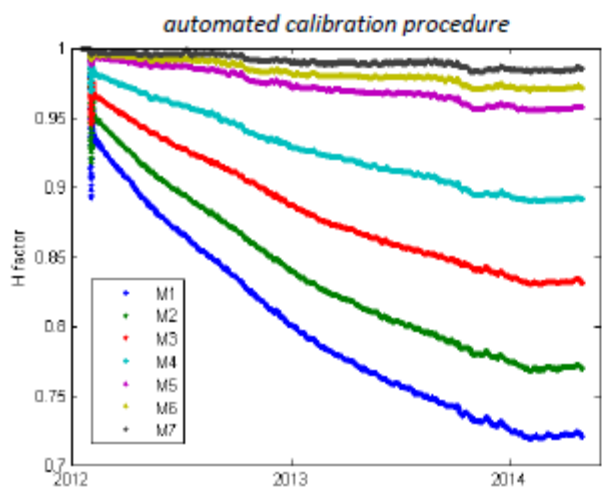
Calibration Trend Change



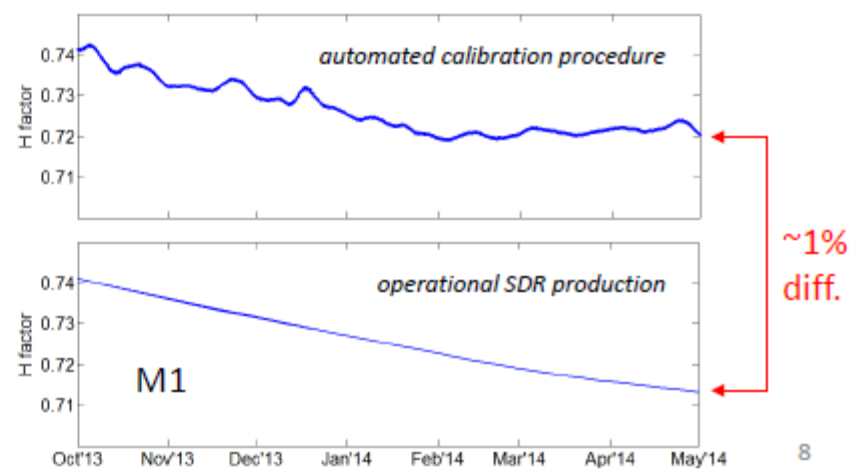
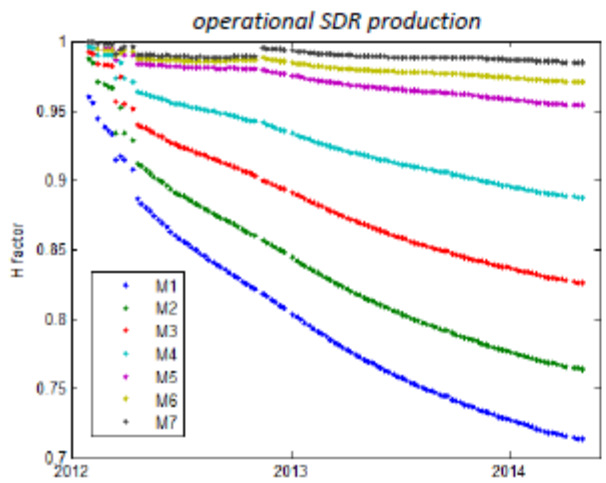
- On February 4, 2014, VIIRS single-board computer lockup anomaly occurred and lasted longer than one orbit
- Following recovery from the anomaly (marked by the spike in the M9 F factors: see the insert graph), the F factor trends have changed

- Despite fluctuations in the calculated F factor values, it is clear that the F factors for the SWIR bands are no longer increasing due to the telescope throughput degradation (note that solar diffuser reflectance is assumed constant for the SWIR bands)
- The telescope degradation may have stopped if during the February 4 anomaly the telescope mirrors temperature increased enough to “bake out” water ice that after the UV photolysis was providing protons for the tungsten oxide color center formation

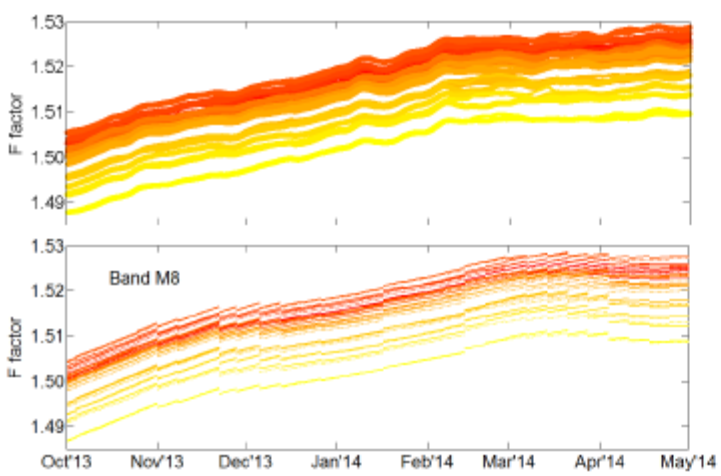
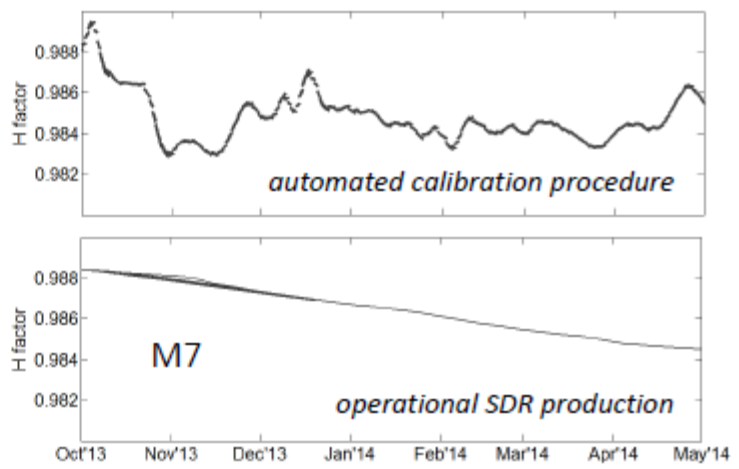
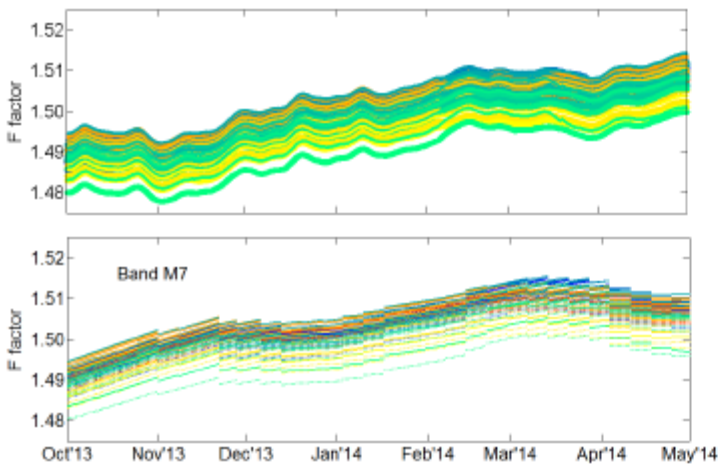
Solar Diffuser Degradation Trend



- When the solar diffuser monitoring data are analyzed with the automated calibration procedure, the reflectance degradation trend changes in February 2014: the decrease has diminished
- If during the February 4 anomaly the solar diffuser temperature increased above ~ 360 K, the hydrocarbons that cause the degradation may have been baked out (in vacuum)



Effects on Radiometric Calibration



- For the bands not corrected by the H factors (SWIR), the automated procedure responded more timely to the calibration trend changes
- Additionally, for the bands corrected by the H factors, the automated procedure responded better to the changes in the solar diffuser degradation