VIIRS SDR Breakout Session
Opening remarks: accomplishments and path forward

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• VIIRS calibration is closely monitored at 30+ cal/val sites worldwide;

• Time series shows the calibration is very stable, and accurate (better than the +/-2% spec);

• Comprehensive calibration & monitoring include monthly maneuvers such as lunar cal, as well as DNB offset and gain transfer (VROP702)
• Validation using San Mateo bridge lights (faint light near Lmin)

• Time series shows NASA LandPeate is consistent with IDPS radiances

• Lunar has minimal impact in clear sky due to narrow bridge width, except in cloudy cases

• Further work expanded to oil platforms
• Rotating Telescope Assembly (RTA) mirror degradation was a major anomaly, due to prelaunch contamination;
• Band M7 has the largest degradation (~70%) since launch;
• The degradation rate has become negligible since a year ago;
• The VIIRS SDR team actively maintains the calibration to compensate for the degradation;
• Impact on users are only limited to early orbits during beta maturity.
VIIRS SDR Team 2015 Top Ten Accomplishments

- Developed J1 VIIRS DNB waiver mitigation and delivered pre-operational software to the program on-time, which greatly reduced program schedule and cost risks (Wang & Lee), in addition to operational straylight correction.

- Prepared all 47 J1 VIIRS LUTs (ver1.0) based on analysis of prelaunch test data, tested using ADL and simulated J1 data, and delivered to the program(Aerospace/VCST/STAR);

- Developed and demonstrated VIIRS DNB radiometric and geolocation monitoring/characterization capabilities using nightlight point sources (Cao & Bai, 2014, RS.), which is critically needed for J1 postlaunch validation of the waivers;

- Expanded validation time series with the 30+ validation sites worldwide, with added capabilities in the SWIR bands, as well as comparing with GOSAT FTS hyperspectral observations (Uprety & Cao, 2015, RSE);

- Generated recalibration coefficients since launch with the latest corrections and RSB Autocal (Blonski)
VIIRS SDR Team 2015 Top Ten Accomplishments

- Completed J1 VIIRS prelaunch test data analysis (VCST/Aerospace/STAR)
- Improved RSB autocal maturity;
- Geolocation thermal chip development for the infrared bands;
- Modeled VIIRS solar diffuser degradation using surface roughness and metrology;
- Active nightlight SBIR project feasibility study in support of VIIRS DNB cal/val.
Active Light Sources for DNB

Enables active remote sensing using passive instrument with well known ground truth
- Reference for existing point sources
- Study night atmosphere (aerosol, cloud, etc)
- Validate radiative transfer for point sources
- Perform spectral studies using different lights (make your own band).

Site requirements
- Clear sky
- Low aerosol loading
- Dry and thin atmosphere
- No lights nearby
- Large water body (such as lakes)

VIIRS/DNB Cal/Val Benefits
- Reduce absolute uncertainties
- Improve stability over time
- Validate the scan vs. radiance bias across aggregation zones (J1)
What’s Ahead?

- VIIRS Cal/Val Special Issue (due Oct 30, 2015)
- Additional waiver mitigation
  - SWIR nonlinearity
  - Saturation
  - Bad detector
  - Improve LUTs
- VIIRS SDR L1.5 product development (in collaboration with SST team)
  - Bow-tie refill
  - Feature contiguity in bow-tie deletion zone
  - Striping reduction
- VIIRS SDR reprocessing
- RSB autocal operational
- Field campaign preparation augmenting J1 cal/val in conjunction with GOES-R ABI, including near surface measurements with polarimeter, goniometer, and UAS based systems;
- Finalize Cal/val plan and ATBD

http://www.mdpi.com/journal/remotesensing/special_issues/VIIRS