Discussion:

Migration of Reflective Solar Reference Instrument: from Aqua MODIS to S-NPP VIIRS

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Background

- **Aqua MODIS has been used as the reflective solar (RS) calibration reference sensor by the GSICS community for a number of years**
  - Well characterized and validated in terms of traceability and accuracy (±2% in reflectance) for most reflective solar bands (RSB)
  - Widely used and referenced by a number of earth observing sensors, especially by those without on-board calibrators
  - Successfully operated since 2002 and the mission could be extended up to 2020
- **VIIRS should be considered as the RS calibration reference sensor, starting from …**
  - VIIRS was designed and built with strong MODIS heritage and lessons
  - MODIS and VIIRS use similar solar and lunar calibration approaches and strategies for their reflective solar bands (RSB)
  - S-NPP VIIRS (lunched in Oct 2011) provides critical linkage between data records derived from EOS T/A MODIS and future JPSS VIIRS

See presentation 3e (Manik) on Selecting GSICS References

On-orbit Performance

- **Aqua MODIS**
  - Wavelength-dependent SD degradation (large at short wavelength)
  - Large changes in VIS and NIR; small changes in SWIR
  - Changes in sensor responses versus scan-angle (RVS)

- **VIIRS (S-NPP)**
  - Similar to Aqua MODIS but with larger degradation rate (no SD door in VIIRS)
  - Large changes in NIR and SWIR (due to mirror contamination)
  - On-orbit modulated RSR (wavelength dependent optics degradation)

More Details: Presentations of 4a and 4b in GRWG: VIR/NIR General Session

Discussion

- Migration of RS calibration reference from Aqua MODIS to S-NPP VIIRS
  - Aqua MODIS: from mid 2002 to …
  - S-NPP VIIRS: starting from … to …
- Issues need to be considered or addressed:
  - What data collection (or version) from each sensor to be used for calibration reference: MODIS C6; VIIRS(??)
  - Calibration difference (offset) between MODIS and VIIRS as each sensor/channel is calibrated independently (a challenging task)
    - Various factors, such as RSR, BRDF, and lunar model, for consistent inter-comparison
    - Inter-comparison via reflectance or radiance
    - Reference to closely matched spectral bands
    - Independent studies, multiple approaches, and rigorous reviews ➔confidence, validation, and quality assurance)