Summary of ‘Satellite instrument pre- and post-launch calibration’

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First part: instrument calibration experts

- Presentations focusing on brief instrument description and lessons learned during instrument characterization and calibration (pre-launch and on-orbit)
- Covered a wide spectrum of instruments: OCM-2, MERIS, OLCI, GOCI, MODIS, VIIRS, SGLI

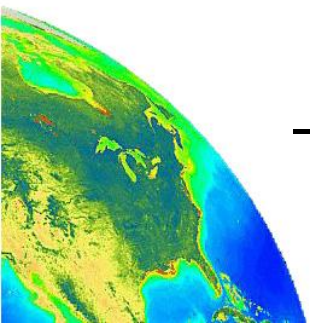
ISRO: OCM-2

Sensor Characterization:

- Pre-launch Spatial & Radiometric
- Onboard calibration using LEDs
- Vicarious calibration using Ocean Buoy (Kavaratty)
- Lunar Calibration (three since 2010)

ESA: MERIS, OLCI

- Main calibration source: white solar diffusers
- Protected solar diffusers degraded by small amounts only (e.g. 0.2%)
- CCD characterization is important (straylight, smearing)
- Instrument model and characterization measurements are combined to produce operational correction
- Hyperspectral design requires spectral monitoring (erbium doped solar diffuser, Fraunhofer lines, O2A)
- Angular sampling improved for OLCI prelaunch SD characterization



KIOST: GOCI

- GOCI on-orbit temporal trending via transmissive solar diffuser
- Very little gain degradation detected so far
- Seasonal oscillation in gains not understood (solar angle dependent)

NASA: MODIS, VIIRS

- MODIS design lead to scan-angle dependent degradation, challenging to calibrate
- MODIS and VIIRS solar diffusers are not well protected, leading to large degradation at 412nm (>10%)
- Both MODIS (on Aqua and Terra) are currently relying on calibration sources in addition to solar diffuser and moon

JAXA: SGLI

- SGLI-VNR has multiple on-board calibration functions, diffuser for solar irradiance and lamp (LED) calibration.
- Maneuver is planned for evaluating BRDF of the solar diffuser after the launch.
- SGLI is planned to see the moon at a constant phase angle monthly by pitch maneuver of GCOM-C satellite

Second part: framework for future work

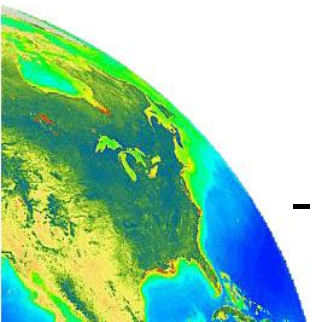
- Tim Hewison: GSICS (Global Space based Intercalibration)
- Ewa Kwiatkowska: new inter-Agency task force on satellite sensor calibration

GSICS

- GSICS is an international collaborative effort initiated in 2005 by WMO and the CGMS
- goal: intercalibrate TOA radiances for different sensors
- Successful history with Infrared sensors and Geostationary sensors
- Participation by ocean color instrument calibration experts is encouraged, plans for LEO-LEO intercalibration are in early stage

Consensus:

- We are working on common issues
- We need a platform to share information and go into detail for focused tasks
- We should meet regularly (regular webmeetings, plus at least for each IOCS meeting)
- Agreement to have an initial telecon to define future activities, e.g. instrument characterization issues
- We will not just work on radiometric calibration, but on instrument characterization in general (e.g. straylight, polarization); details in IOCCG report 13 (available outside)
- Agencies need to support this kind of activity



Discussion

- What are the exact goals of this group?
  - Improve instrument characterization (e.g. straylight, polarization, etc.)
  - Absolute calibration
  - Vicarious calibration
  - Intercalibration
  - ECV
  - Documentation

Discussion

- What's the most appropriate framework ?
  - New group under CEOS-IVOS WG or CEOS OCR-VC?
  - CEOS-IVOS is a potential candidate, but not focused on ocean color
  - Should a IVOS subgroup be created?
  - Or an IOCCG/INSITU-OCR task force?
- No consensus reached, need IOCCG guidance