SCM-05: Advancing the AVHRR FCDR – a SCOPE-CM cooperation project between EUMETSAT, NOAA, ESA and NASA

**Status report (Oct 2016 – May 2017) for Webex conference
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Karl-Göran Karlsson

SMHI, Norrköping, Sweden

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Achievements

1. Upgraded visible calibration corrections (MODIS Collection 6)

Responsible partner: NOAA (A. Heidinger)

- NASA Langley (Ben Scarino and Dave Doelling) have developed a web-based tool to compute spectral band adjustment factors (SBAF) for many surface targets using the SCIAMACHY spectra.

- PATMOS-x has adjusted its surface targets to match those provided by the NASA Langley SBAF sites and uses the SCIAMACHY values instead of the RTM-based SBAF values.

- Studies of VIIRS 0.65 and 0.86 micron channels show that reflectances are about 4% too high. Requires further studies since VIIRS is thought to replace MODIS as the reference for calibration in the future.

1. Upgraded visible calibration corrections (MODIS Collection 6)

Responsible partner: NOAA (A. Heidinger)

- A recompilation of the PATMOS-x AVHRR calibration is started using these new SBAF values.

- Studies of VIIRS reflectances continues.

Achievements

2. Revised infrared calibration (new physical model)

Responsible partner: ESA (ESA-SST-CCI, FIDUCEO, Jon Mittaz)

- Have characterized most uncertainty sources for random and systematic effects and are creating initial (pre-Beta) datasets with a single pixel estimate

- Have implemented data quality filtering (ICT/Space views) and calculate noise estimates which take into account in a limited way the impact of a variable noise spectrum

- Currently working on creating a harmonized set of calibration coefficients in a metrologically consistent manner

Near future plans

2.   Revised infrared calibration (new physical model)

Responsible partner: ESA (ESA-SST-CCI, FIDUCEO, Jon Mittaz)

- Start working on possible SRF issues and on impact of solar contamination events on both the calibration system as well as in the Earth view

- Beta version of complete FCDR dataset due to be ready by Oct/Nov

Achievements

3. **Revised navigation based on image-retrieved (coast-line matched) update of orbital model (yaw, pitch,roll corrections)**

**Responsible partner: EUMETSAT (CM SAF, K-G Karlsson)
                        + ESA (ESA-CLOUD-CCI, M. Raspaud)**

- The feasibility to retrieve clock errors by image matching with NASA Blue marbles has been successfully demonstrated on NOAA-14 data.

- Clock errors have now been estimated for the morning satellite NOAA-12 (having no clock errors estimated earlier)

- NOAA-12 results show retrievable clock error trends but also a significant variability which is larger than for NOAA-14 ➔ linked to large attitude errors.

Near future plans

3. Revised navigation based on image-retrieved (coast-line matched) update of orbital model (yaw, pitch,roll corrections)

Responsible partner: EUMETSAT (CM SAF, K-G Karlsson) + ESA (ESA-CLOUD-CCI, M. Raspaud)

- Method to be applied to additional morning satellites (e.g. NOAA-10)

- Extension of the method to also cover attitude parameters (yaw, pitch, roll) to be considered

Changes in Maturity matrices

- Progress during the last 6 months doesn't motivate more than minor changes of previous Maturity matrices
  ➔ No update presented at this stage

- More relevant to update Maturity matrices after access to FIDUCEO FCDR