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
10 May 2017

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May 2017
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.
Near future plans

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
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)  
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- 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