FCI SRF status

FCI-MAG#5

Context

- SRF v2016
  - Last FCI SRF dataset shared with the users
  - In December 2016
  - from a combination of theoretical modelling and EM measurements (NIR and IR filters and windows, as well as VIS retinas)
  - For each channel, the SRF has been computed for a representative subset of pixels' positions within the FCI North-South swath. The set of SRFs have been averaged to get a single averaged SRF per channel.
  - No out-of-band information.

- SRF v2021
  - Obtained from PFM subsystem measurements
  - Validated by FCI PFM spectral measurements
  - 3 deliveries from ESA/TAS
    - SCCDB IQTv3.5: one average SRF per channel, no out-of-band
    - FCI CDR: For each channel, detector column and detector elements (pixels). Includes out-of-band information
    - FCI PFM v2: same… but (slightly) different

Next deliveries

- The intention is to share the new SRFs with:

  A. NWP-SAF for the computation of the new RTTOV coefficients. These coefficients (IR) and the SRFs (VIS-NIR) will be shared with HYGEOS for the generation of FCI spectrally-representative 24h test data before the end of 2021.

  B. The general users. The need is less urgent.

Open points

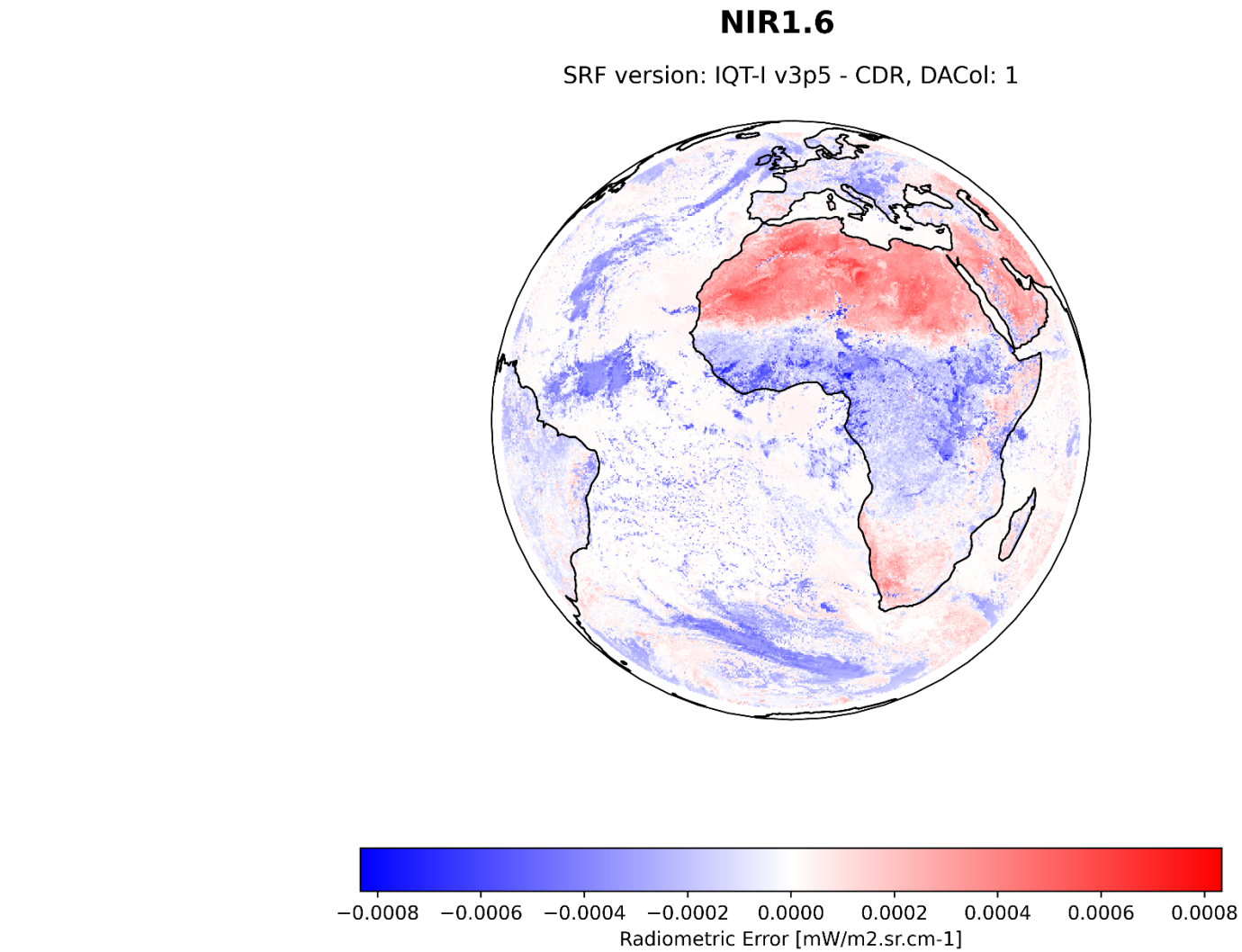
- Open points related to the delivery from ESA/TAS
  1. How was the channel-average computed? On the basis of the 4 columns without bad pixels?
  2. How was the out-of-band filtered-out?
  3. Small differences with EUMETSAT averages of the pixel-level SRFs.

- Open points related to the methodology to calculate the final SRFs
  4. Which pixel selection in the calculation of the average? All valid pixels? Pixel selection?
  5. Should the out-of-band be removed? Full SRF vs reduced SRF.

Impact of pixel selection

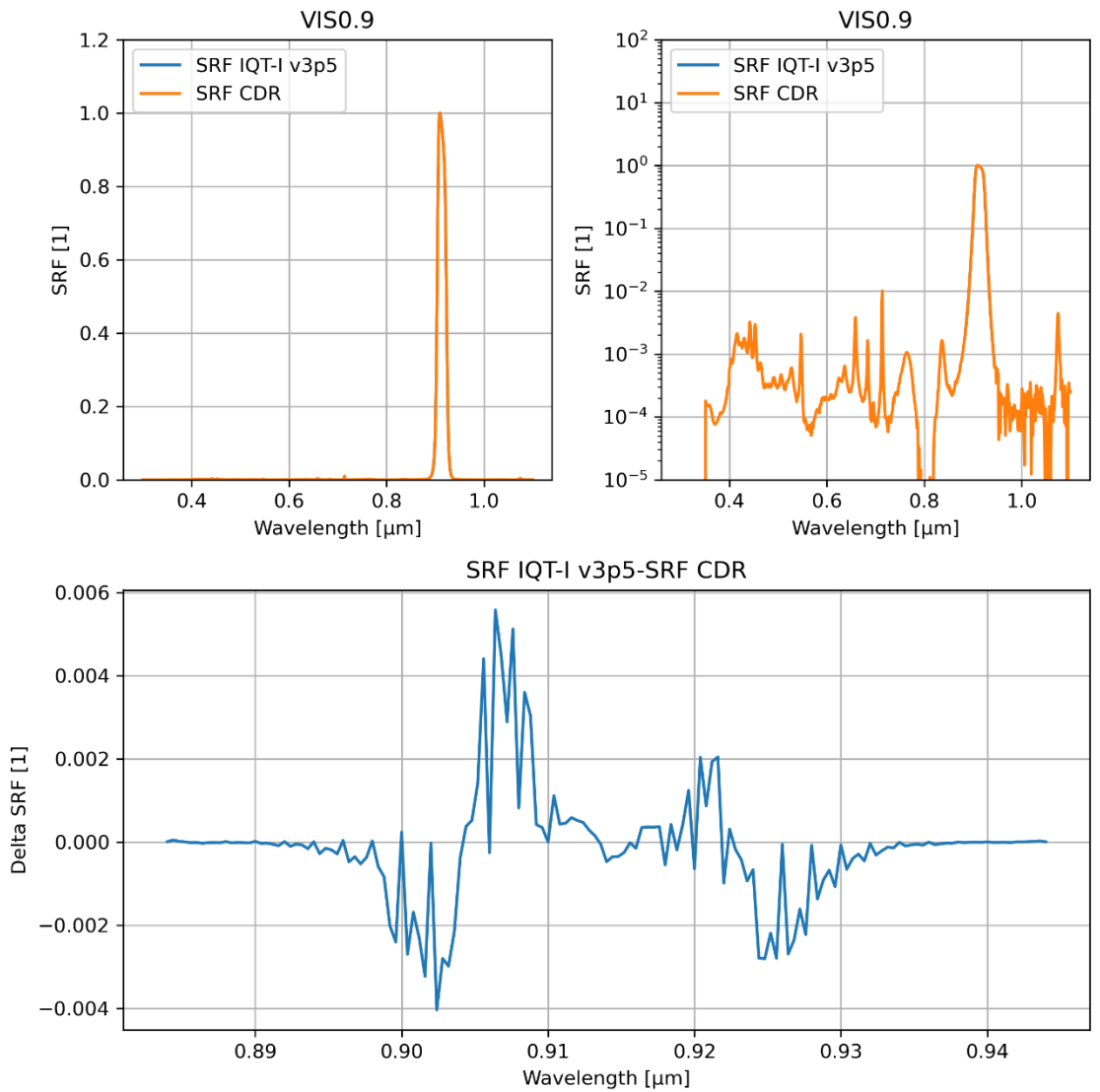
- We have analysed the impact of the pixel selection
  - Using the HYGEOS spectrally-resolved datacube
  - Comparing the average SRF with each column-average
- The impact is <0.1% of radiance
- See https://confluence.eumetsat.int/display/MTGFCIIFCT/SRF+assessment
- Thus
  - The current averaging methodology is suitable
  - No need to update the SRF when we change the detector selection in-orbit !

Impact of pixel selection



Impact of removing the out-of-band

- The HYGEOS spectrally-resolved datacube will be used to assess the radiance errors of the reduced SRF.



Proposed approach

1. Share the SCCDB SRF with NWP-SAF+HYGEOS.
2. Converge with ESA and TAS on the exact content of SCCDB SRF.
3. Complete impact analysis on the out-of-band and issue a report.
4. MAG to review the report.
5. Official delivery to the users.