ECMWF / EUMETSAT NWP-SAF Workshop

The Assimilation of Hyper-spectral Geostationary Satellite Observations

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Instrument Processing and RT Simulation Working Group Notes

Instrument processing and RT simulation

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EUMETSAT processing: L0→L1 processing

- Doppler shift correction – EUMETSAT will check if it is needed, and add to ATBD if necessary.

- Uniformisation – REC. NWP users would like data from all detectors to be corrected to same SRF. ATBD should contain details of the proposed approach.

- Apodisation. The current baseline includes light apodisation. This approach is supported by the NWP community.

- PC compression – Global or Local?
Note: EURD says that baseline is GLOBAL.
REC.: Strong preference of NWP users for GLOBAL:
    - to avoid changes in error correlations between dwells
    - to reduce processing required by users
    - to limit risk of option for which experience is limited (Global method is well understood for IASI.)

- Metadata. REC: NWP users would like to review current plans for metadata (data content as specified in PFS document). Support this with request via OpsWG for sight of PFS and test data.

- Cloud information. Is it required in L1 product? YES. Currently, a flag is planned. Users would find a quantitative measure of scene homogeneity more useful.

EUMETSAT processing: L2 processing

- AMVs. NWP will use AMVS, and so has an interest in quality of L2 temperature/humidity retrievals from which AMVs are generated.
REC.: It is important that L2 profiles make the best possible representation of vertical structure (e.g. tropopause, inversions, PBL top) for which there is no significant information in the radiances.

Instrument – spectral response

- Icing of detectors and other optical components. If IRS has problems similar to SEVIRI, detector icing will result in changing spectral response, particularly around 13 microns. Users would like to understand the planned approach for monitoring and mitigating this problem.

EUMETSAT CAL/VAL

- Common approach with IASI-NG should be considered.

- As usual, NWP community is seeking to play a strong role, particularly for L1 products but also for L2.

- IASI and IASI-NG data should be used as one of the primary CAL/VAL references.

- The procedures followed for METOP-A, for engagement of the NWP community and early access to L1 data, were excellent – provides a good model for MTG-IRS to follow.

- Special scanning patterns should be considered during the commissioning phase to study detector array performance and uniformity.

MTG-IRS Pre-Processor (NWP SAF software)

- The NWP SAF plans to develop this package and is seeking user input on its scope and requirements.

- Initial suggestions:
    - Input: L1 PC scores , as disseminated by EUMETSAT
    - Output: Data suitable for input to NWP systems, with optional formats including BUFR and an output similar to the input
    - Optional processing modules:
        - PCs → reconstructed radiances
        - Transformations to other PC bases
        - Apodisation or deapodisation
        - Thinning and/or averaging
        - Others?
    - Features with SEVIRI heritage should also be considered

GIIRS on FY-4A and subsequent satellites
- REC: Seek collaboration with CMA, particularly on all aspects of L0→L1 processing
- Establish patterns of working between CMA, EUMETSAT and NWP community that can be use for FY-4A data and for subsequent instruments that resemble MTG-IRS more closely

RT modelling
- REC: Consider if profile training data sets used for RT models arwe adequate, particularly in their representation of land surface variability
- To understand the use of lightly apodised spectra, encourage studies of apodisation and its reversibility without significant loss of information
- Encourage studies of land surface emissivity – are diurnal variations real of artefacts of retrievals schemes.
- Simulations at large viewing angles.

Bias correction. NWP community should prepare for:
- Uncorrected biases across the detector array
- Uncorrected temporal changes in bias, noting that the MTG-IRS will not use a full-aperture calibration.