Status of IRSPP

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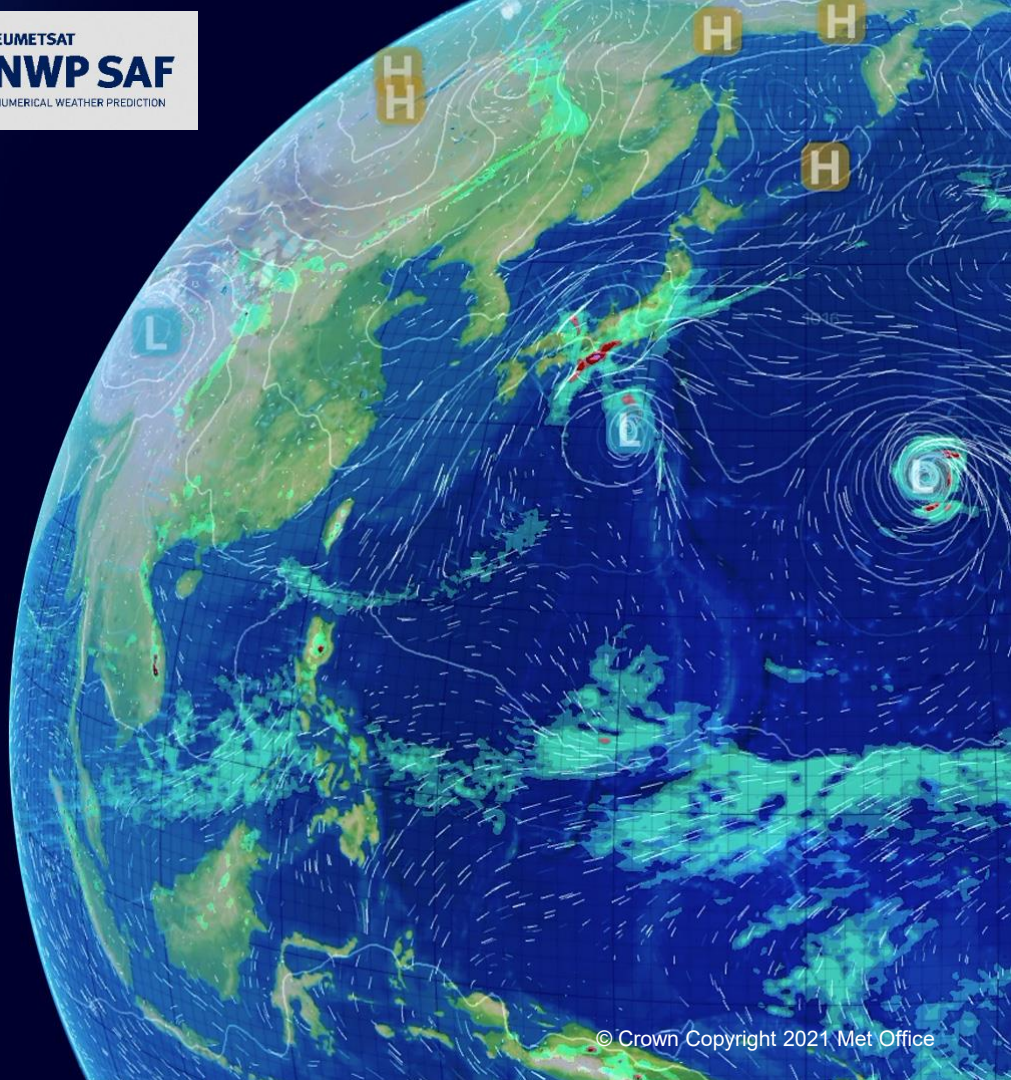


Introduction

- IRSPP is the NWP SAF processing package for MTG-IRS
- IRSPP releases are often prompted by EUMETSAT data releases:

IRSPP version	IRSPP Release date	EUMETSAT test data release	Comment
1.0	March 2022	Dec 2019: TD-287	First IRSPP release, single dwell test data
1.1	October 2022	July 2022: TD-406	First full-disk dataset
1.2	February 2023	Nov 2022: TD-417	
		Dec 2023: TD-443	
1.3	October 2024	July 2024: TD-521	
		Feb 2025: TD-528	“final” spectral grid

Functionality

For operational processing of the NRT data (netCDF format, PC compressed)

- Generation of reconstructed radiances (RR) for specified channels. Option to use, or not, the dynamic PC scores
- Option to apply a heavy apodisation ("HAOTOLA" - *Hamming*-Apodisation-On-*Top-Of-Light*-Apodisation)
- Thinning (1 row in *n*, 1 column in *m*) to reduce volume for global NWP – now with a "warmest field of view" option
- BUFR encoding. The user can choose the number of channels/PCs to be included.

More specialised functions

- Generate covariance matrix from many SSS (full-spectrum) files, or from simulated radiances from NWP SAF RadSim package
- Generate eigenvectors from covariance matrix and noise profile (uses LAPACK)
- Generate PC scores and RR from SSS file
- Compute transformation matrix, for transforming to alternative basis function (see later)
- Transform EUMETSAT's PC files to alternative basis function and output the new scores in BUFR

Implementation

- Coded in Fortran90, using the netCDF Fortran API and ecCodes
- To read some of the variables requires the hdf5 Fortran API
  - e.g. enumerated variables and variable length string attributes
  - See EUMETSAT's **MTG IRS L1 Product User Guide**
- To be distributed as source code, plus build script (as is normal for NWP SAF deliverables)

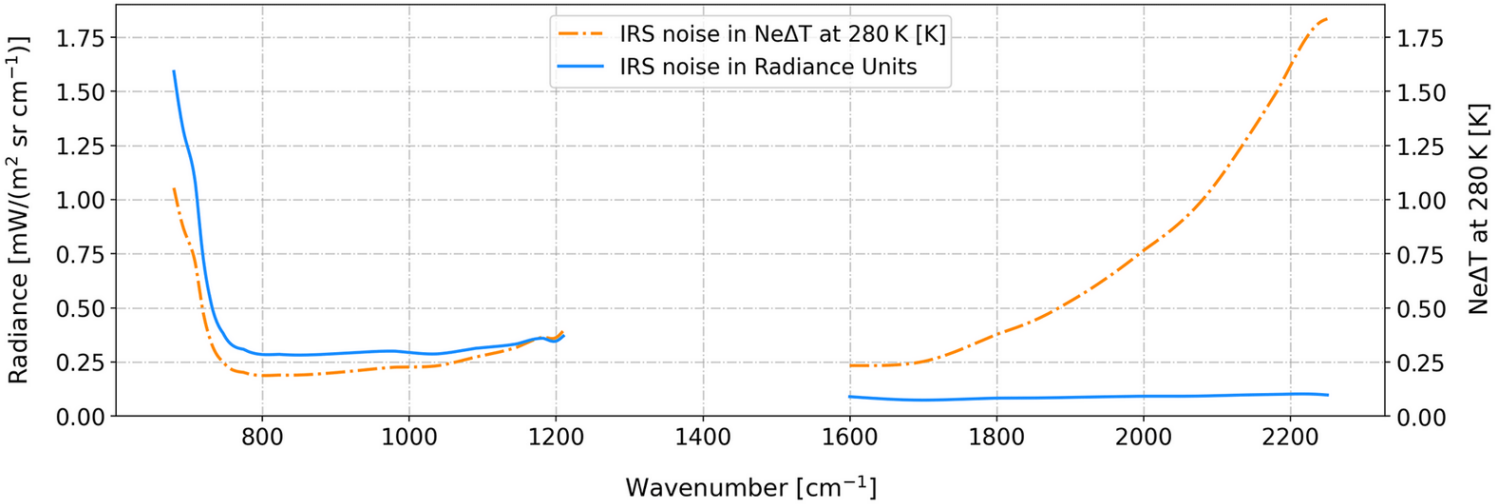
Recent changes

- IRSPP v1.3 has been tested with the latest IRS Test Data (**TD-528** – with the “final” spectral grid) and works OK. You need to run a tool (available in IRSPP v1.3) to modify the ancillary eigenvectors.
- Support for transforming to HT-FRTC basis function has been removed
  - HT-FRTC is no longer supported in RTTOV
- Instead, an option has been added to transform to the PC-RTTOV basis function
  - But note that PC-RTTOV does not have valid coefficients in RTTOV v14, and the future of PC-RTTOV is under review

Planned changes (next minor release)

- Use the EUMETSAT eigenvectors directly in the format of **TD-528**, i.e. no need to run a conversion tool
- Spatial averaging of either the PC scores or the spectra – to reduce noise, especially in the LW CO_2 band.

Vittorioso et al., 2024, AMT



Other potential changes in current version

- Are Météo-France planning to update their channel selection for the new spectral grid?
  - If so … update the IRSPP channel selection namelist
- We understand that some detector elements will perform better than others and that EUMETSAT will provide relevant information
  - Add capability for IRSPP to choose the better-performing pixels
  - Need to know the format to be used by EUMETSAT for this information

Planned changes (post launch)

- IRSPP v2 scheduled to be released after it has been validated with post-launch data.
- We don’t foresee any major changes, unless the Commissioning shows that something is needed.

Met Office

EUMETSAT NWP SAF NUMERICAL WEATHER PREDICTION

Any other requests for IRSPP v2? Please look at the User Guide if you haven't done so.

Thank you!

https://nwp-saf.eumetsat.int/site/software/irspp/