Products and Software Working Group – Interim report – March 2022

Webex attendees: Graeme Martin (SSEC/UW, co-chair), Nigel Atkinson (Met Office, co-chair), Nick Bearson, Hank Revercomb, James Davies, Dave Tobin, Leanne Avila, Mathieu Asseray, Miguel-Angel Martinez, Nathalie Selbach, Pascale Roquet, Silke May, Buddhi Prakash Jangid, Indira Rani

Agenda:

1. Software packages status updates (AAPP, IRSPP, MWIPP, CSPP, IMAPP, FY3, …)
2. Update on JPSS-2
3. Update on Geo-XO follow-on to GOES-R
4. Preparations for MTG and EPS-SG
5. Software packaging including the use of containers (e.g. Docker, Singularity, Podman)
6. DBNet developments including new monitoring pages and interactions with NWP group on VIIRS clusters on CrIS footprint
7. PC representation of hyperspectral radiances
8. PSWG web pages (move to WordPress)
9. Any other PSWG action items not already covered in the discussion, or topics for next ITSC

Slides are available at https://cimss.ssec.wisc.edu/itwg/itsc/2022interim/index.html

1. Software packages status

Nigel Atkinson presented the status of

- AAPP: releases approximately every 6 months. Preparing for MWS and IASI-NG
- IRSPP: Version 1.0 released. Supports small sample of MTG-IRS test data released by EUMETSAT in Dec 2019.
- MWIPP: Version 1.1 released. Supports MWI and ICI test data released by EUMETSAT in Jan 2021.
- EPS-SG level 1 processors: Being procured by EUMETSAT

It was noted that IRSPP is available in either source or pre-built binaries – consistent with *ITSC23 Recommendation PSWG-2: Software providers should, where possible, offer their software with a choice of either pre-built binaries or source code.*

Graeme Martin presented CSPP-Geo, which is being updated for GOES-18 (recently launched). From 1st August 2022, GOES-18 will be substituted for GOES-17 in the GRB data stream during the periods when GOES-17 data are affected by the instrument cooling issue. By this time, GOES-18 will have been moved close to the GOES-West position, and the imagery will be rectified to the GOES-17 viewing geometry, so the process should be largely transparent to users.

Graeme advertised the 2022 CSPP Users' Group Meeting in Madison and encouraged people to register.

2. Update on JPSS-2

Nothing to report on JPSS-2 as no NOAA representative was present. Scheduled for launch in September 2022.

3. Update on Geo-XO follow-on to GOES-R

Graeme presented the Geo-XO top-level diagram. Three satellites are planned (2032 time frame): GEO-West, GEO-East and a GEO-Central satellite that should include a hyperspectral sounder. There is concern that the sounder is top of the "de-scope list". By the mid-2020s, we should have plenty of experience with MTG-IRS, which should strengthen the argument for retaining the GEO sounder.

4. Preparations for MTG and EPS-SG

Nigel mentioned that EUMETSAT are organising User Days on its next-generation satellite programmes MTG and EPS-SG, 31 May – 2 June 2022. The event is by invitation, but if PSWG members have specific requests or questions then Nigel is happy to raise them at the meeting.

EUMETSAT have already released some test datasets for MTG and EPS-SG, and more are expected during the coming year.

5. Software packaging including the use of containers

Jim Davies gave a presentation on his experiences with Singularity for packaging software, including some CSPP packages (e.g. MiRS v3.0). See detailed presentation, available at https://cimss.ssec.wisc.edu/itwg/itsc/2022interim/index.html. The use of containers has the potential to make the software more portable, i.e. not just confined to a specific operating system. Sudo root privilege is needed to build the package, but to run it the user just needs to have Singularity installed. This is still primarily aimed at Linux systems; these containers do not yet run on Windows.

Running containers in an operational context is not necessarily straightforward; at the Met Office there are signing requirements, and Singularity is not currently installed on operational machines. Pascale Roquet explained that Météo-France has experience with Docker as an off-line tool, but it is not currently used as part of an operational processing chain.

Containers are foreseen to become more important as applications are migrated to the Cloud. For example, Geo-XO may not have a direct broadcast system as data are likely to be available in the Cloud.

A downside is that containerised versions of packages can be rather large, as the container itself takes up significant space.

Graeme mentioned that some internal SSEC documents already exist that are relevant to containers, which could have wider interest. He agreed to collate material and post on the PSWG web site. This is covered by an existing ITSC-23 action: *Action PSWG-4: CSPP and IMAPP teams to share UW/SSEC/CIMSS experiences on working with containers (Docker, Podman, Singularity), including lessons learnt, via the PSWG web site*.

6. DBNet developments: monitoring pages and VIIRS-to-CrIS clusters

There have been discussions on VIIRS clusters in the NWP working group, and NOAA are working on the issue. It is not yet clear how closely NOAA's approach will be to that already implemented in AAPP. Liam is running the AAPP clusters routinely on a test basis.

Nigel advertised the new DBNet "traffic-light" status page developed by his colleague Elisabeth Nolland. It conveys a lot of information in a concise way.

Indira Rani pointed out that NCMRWF receive direct broadcast data over India, which is not included in the NWP SAF tables. This will be followed up outside the meeting.

Mathieu Asseray gave a presentation on the new IASI monitoring facility developed by Météo-France, in which global versus local comparisons are expressed in terms of cloud fraction as well as brightness temperature. Maps and statistics are available.

7. PC representation of hyperspectral radiances

Dave Tobin reported that the CrIS SDR Science Team is implementing EUMETSAT's "hybrid" approach (in which a small number of local PCs supplement a fixed set of global PCs) for the CrIS SDR product. This work is motivated by MTG-IRS. Compared to the standard SDR product, the CrIS PCA product has ~80% random noise filtering and a factor of ~21 volume reduction.

Sample data could be made available in a few months. However, discussions with NOAA would be needed if such a product is to be operationally supported.

Graeme mentioned that data reduction in the satellite to ground downlink could be very important for Geo-XO, and PC compression could be a way of achieving this. Nigel explained that for IRS the PC compression is part of the ground processing, not done on-board. A full-spectrum IRS product will be available from the EUMETSAT Data Centre.

8. PSWG web pages

Leanne Avila reported that the ITWG web pages will be migrated to Wordpress before the next ITSC. Experiences with Wordpress so far have been positive and several other centres are also using it (e.g. NWP SAF). The PSWG web pages are due a refresh. Covered by an existing action from ITSC-22: *Action PSWG-6: PSWG co-chairs to update the group web page by next ITSC, assuming Wordpress is implemented by CIMSS as planned.*

9. Other items

Nathalie Selbach mentioned that her colleague has used a Python utility to download GOES data from the Amazon Web Services archive – called GOES-2-go. See also the NOAA list of big program datasets.