

## **The 18<sup>th</sup> International TOVS Study Conference (ITSC-18) Report to NASA**

The International TOVS Study Conference has been meeting every 18 to 24 months since 1983 to advance understanding and effective use of passive infrared and microwave satellite sounding data, building on the heritage of the first operational satellite sounding system, TOVS. The latest and 18<sup>th</sup> meeting was held at Météo France's excellent conference facility in Toulouse, France from 21-27 March 2012. ITSC-18 attracted nearly 154 participants from 20 countries. In addition to 50 oral presentations and 100 posters, the group also has six working groups covering NWP, radiative transfer, advanced sounders, climate, international aspects and products/software packages. It also has technical sub-groups for CRTM, RTTOV, RARS, surface properties and direct broadcast packages where users of these services can discuss directly with developers.

The meeting presented an opportunity to show early results using new observations from the Suomi-NPP satellite and it is clear that both sounding instruments, ATMS and CrIS, are of excellent quality. The microwave sounder, ATMS, is already being tested in a pre-operational data assimilation environment, with both NCEP and ECMWF reporting some positive forecast impact. The CrIS instrument builds on the success of both AIRS and IASI, and the meeting presented new insights into improving use of high spectral resolution data, through both principal component analysis and more sophisticated treatment of clouds, aerosol and surface emissivity. High spectral resolution infrared observations from polar orbit now form a mature part of the global observing system and there is a strong requirement for both infrared and microwave sounders in three orbital planes. In addition to Low Earth Orbit imagery and sounding and other missions such as radio-occultation, the WMO 2025 vision for the global observing system includes geostationary high spectral resolution infrared sounding in a complete circle of the earth. Real progress is now being made towards this vision with the new baseline adopted by CGMS. Geostationary hyperspectral instruments are planned to be provided by Europe and China, and there is a US-led private initiative, GeoMetWatch, which could provide a service to other agencies wishing to contribute to the CGMS vision.

Another key topic at ITSC-18 was the Regional ATOVS Retransmission Service (RARS), which attracted considerable interest. RARS uses existing ground stations to receive direct broadcast ATOVS data from NOAA and Metop satellites and then process uniformly using the ATOVS and AVHRR Pre-processing Package (AAPP). The data are then redistributed via the GTS, giving 75% global coverage within 30 minutes. In this context it was also very welcome at ITSC-18 to hear about the CSPP package for direct broadcast Suomi-NPP data, and progress being made also for FY-3B data. Actions are being taken to include CrIS, ATMS, and IASI data into the RARS. It is known that data assimilation systems such as 4D-var are most sensitive to observations at the end of the data window, so acquiring these observations in a timely manner ensures good coverage of satellite sounding observations in the last hour of the data assimilation window.

Data assimilation methods are making increasing use of ensemble techniques to describe background error but the treatment of observation errors remains highly simplified. However there were a number of presentations examining methods to characterise correlated error and its impact, as well as more basic retuning of the observation error variances. Forecast impact is being evaluated using observing system experiments, and increasingly also by forecast error contribution, using adjoint sensitivity techniques and/or ensemble spread to evaluate observations. Two centres

outside the USA reported that they are now testing NCEP's GSI 3D-var for their data assimilation, and by implication the CRTM model, for data assimilation (CPTEC in Brazil and NCMRWF in India).

Finally it was a pleasure to award the prizes for the best oral presentations at ITSC-18 to Pauline Martinet (Météo France) and Stuart Newman (Met Office), and the prizes for best posters to Graeme Martin (UW-SSEC), Anna Booton (Met Office) and Dave Tobin (UW-SSEC).

Météo France were excellent hosts and the appreciation of the ITWG community goes especially to Vincent Guidard and Jean Maziejewski as well as to Maria Vasys, Bill Bellon and Leanne Avila at UW-SSEC for their continued support.

The conference is partially supported financially by NASA headquarter. The long lasting support by NASA is fully acknowledged by all participants.

For more information about ITWG please visit the website at <http://cimss.ssec.wisc.edu/itwg/index.html>

For detail working group report please go to website [http://cimss.ssec.wisc.edu/itwg/itsc/itsc18/WGR\\_v1.pdf](http://cimss.ssec.wisc.edu/itwg/itsc/itsc18/WGR_v1.pdf)

For ITSC-18 program with presentations and papers please visit the website at <http://cimss.ssec.wisc.edu/itwg/itsc/itsc18/program/index.html>

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