

# Use of radiances in the operational global assimilation system at Météo-France

Florence Rabier, Elisabeth Gérard, Thibaut Montmerle\* and Delphine Lacroix

*CNRM/GMAP, Météo-France,  
42 Av Coriolis, 31057, Toulouse, France*

*\*: EUMETSAT fellow*

## Introduction

Since October 2002, raw ATOVS radiances have been gradually inserted into the operational data assimilation system at Météo-France. After the successful implementation of AMSU-A in 2002, HIRS was added in 2003. Since October 2004, new data from the ATOVS sounders on board the NOAA satellites have been assimilated in the Arpège model: these are AMSU-B and EARS data. These developments are described in this paper.

## Use of AMSU-B and EARS

The additional use of AMSU-B data has been tested in 2004, with a significant positive impact in terms of geopotential forecast scores. Three channels are assimilated over sea and two over land. The impact in terms of humidity analysis is complementary to what was observed for HIRS data. The assimilation of HIRS data was mainly drying the analyses over the oceans. AMSU-B has the opposite effect of moistening the atmospheric analysis, but this increase in humidity takes place over the continent. Adding these observations has a positive effect on the spin-up of the model. Analyses and forecasts are now seen to be more consistent.

One drawback of the ATOVS data, is that they are received by NOAA in the United-States, then transmitted to Europe. This implies delays to the reception of data used in the Arpege "production" analyses used to initialise the forecast model, knowing the tight schedule imparted. A complement to the processing of these global data is to use data processed locally in local reception stations, and then redistributed by EUMETSAT in a much shorter time (the so-called EARS= EUMETSAT ATOVS Retransmission Service project). These observations are tailored for our needs by CMS=Centre de Météorologie Spatiale, Météo-France(Lannion), where reconstructed long orbits guarantee a better data homogeneity, as shown in Figure 1. This processing allows more data to be inserted by the "production" analyses, and also in the "assimilation cycle" analyses providing the best atmospheric description in near real time, as can be seen in Figure 2. Due to these changes, data from the ATOVS sounders are currently fully used in operations.

## Future work

The focus will now be on new sounders, such as the advanced AIRS sounder from NASA and the IASI interferometer soon onboard the Metop satellite (CNES/EUMETSAT). A preliminary assimilation suite is being run in development mode, using about 120 AIRS channels over sea. Results are slightly positive and an operational implementation is planned for end 2005. Developments are also under way to process and assimilate IASI data.

## Acknowledgements

Our Arpège code is developed jointly with ECMWF. Our implementation of satellite data assimilation benefits substantially from code developed at ECMWF, and the Satellite Section staff are acknowledged here for their developments

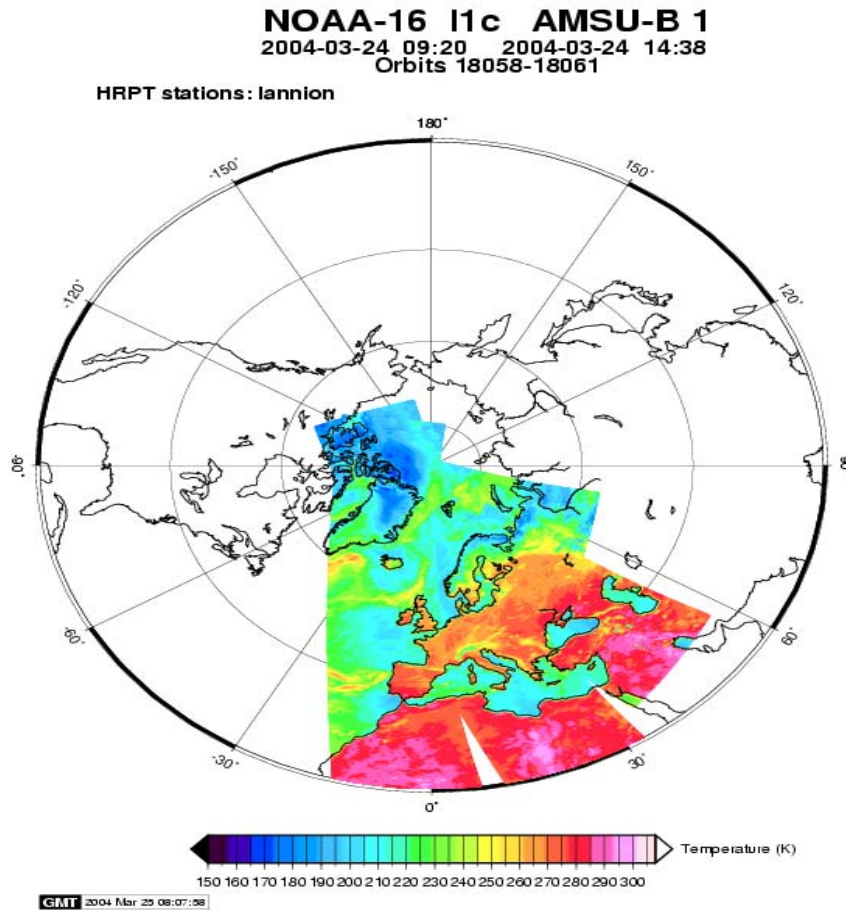


Figure 1: Data distribution for the ATOVS data created by CMS (Lannion) from EARS and locally received data.

1 er mai 2004 r12

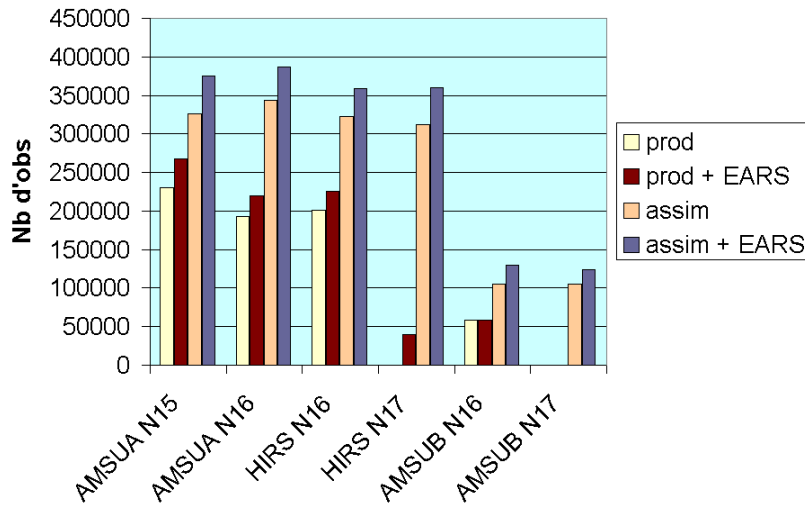


Figure 2: Number of observations available for the various 20040501, 12Z analyses.