Assimilation of new sounder data in the operational system at Météo-France

Elisabeth Gérard, Thibaut Montmerle* and Florence Rabier

CNRM/GMAP, Météo-France, Toulouse
*: EUMETSAT fellow
email: elisabeth.gerard@meteo.fr

Since October 2004, new data from the ATOVS sounders on board the NOAA satellites have been assimilated in the Arpege model. Let us recall that the ATOVS sounder includes 3 instruments (AMSU-A, AMSU-B et HIRS). Until now, data from the AMSU-A and HIRS instruments that were assimilated, provided information on atmospheric temperature and humidity profiles. The additional use of AMSU-B data has been tested in 2004, with a significant positive impact in terms of geopotential forecast scores, and major changes in the humidity analysis over the continent. 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 project). These observations are tailored for our needs by CMS, 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, and 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).

ATOVS= Advanced TIROS Operational Vertical Sounder
NOAA= National Oceanic and Atmospheric Administration
AMSU= Advanced Microwave Sounding Unit
HIRS= High Resolution Infrared Radiation Sounder
EARS= EUMETSAT ATOVS Retransmission Service
AIRS= Atmospheric Infra-Red Sounder
IASI= Interféromètre Atmosphérique de Sondage dans l'Infrarouge
= Infrared Atmospheric Sounding Interferometer
CMS=Centre de Météorologie Spatiale, Météo-France, Lannion.

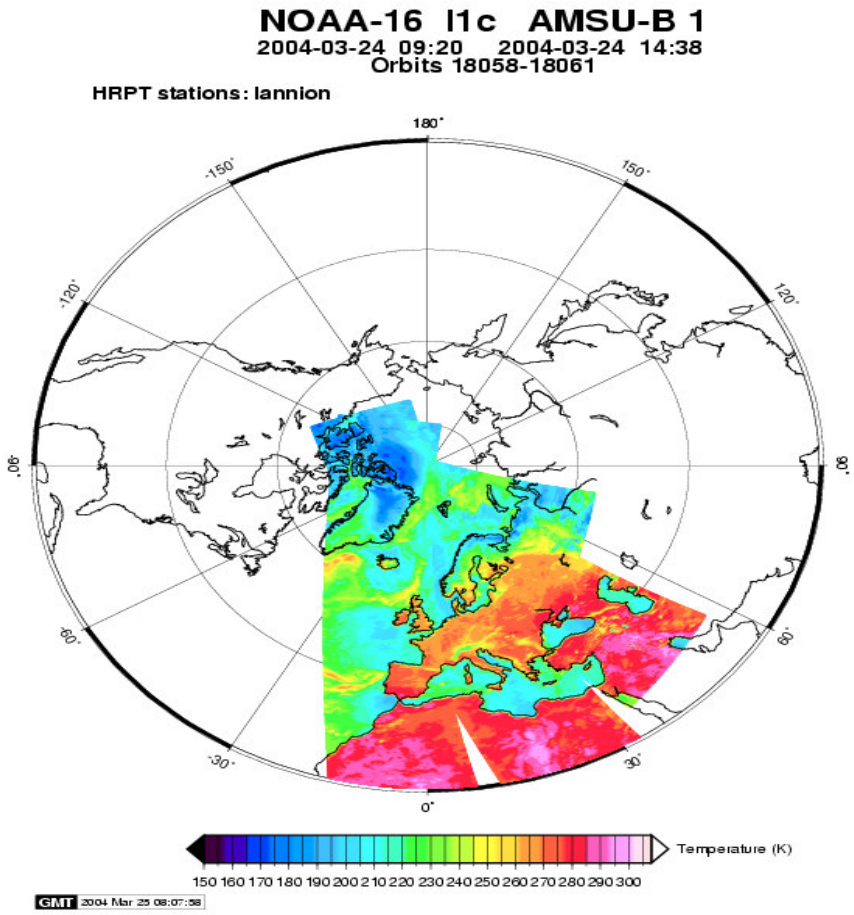

Figure 1: Data distribution for the ATOVS data created by CMS (Lannion) from EARS and locally received data.

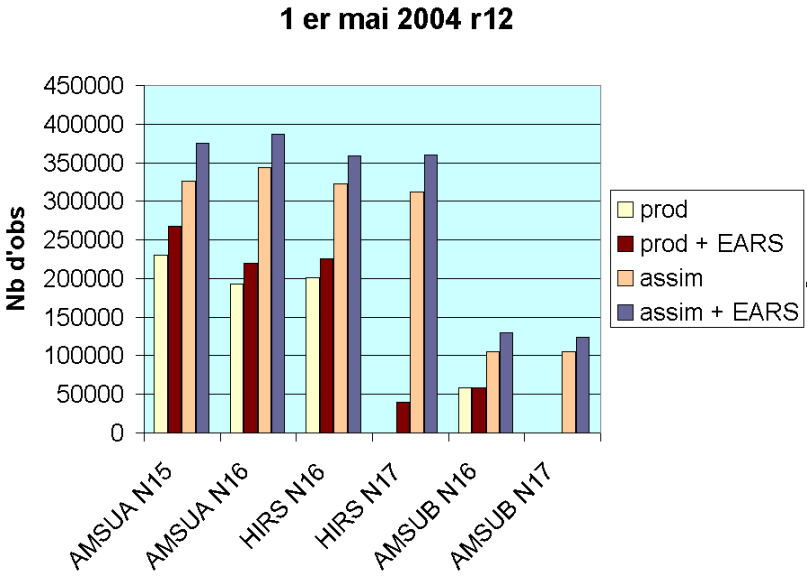

Figure 2: Number of observations available for the various 20040501, 12Z analyses.