Assimilation of GPS RO observations at METEO-FRANCE

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We will present the data assimilation system in use in the operational numerical weather prediction model at Météo-France. Emphasis will be placed on global and limited-area models that are using GPS radio occultation data since September 2007, firstly with the FORMOSAT-3/COSMIC constellation, CHAMP and GRACE-A, and then with GRAS on METOP. More recently TERRASAR-X and C/NOFS have been added.

Moreover, a global study has been conducted to investigate the observation error adjustment. The diagnosis using Desroziers' method (2005) shows that the actual stipulated errors are too big and that observations could be better used. We will present the modifications made for GPS radio occultation observations and their contribution to the assimilation system.

Finally, so as to improve weather forecasts and assimilations, the capability to compute the forecast sensitivity to observations has been implemented at Météo-France. This technique (Langland and Baker, 2004) is now commonly used as a complement to data denial experiments. The linear estimate of each observation contribution to the forecast improvement uses the adjoint model. The code implemented in our global model ARPEGE has been developed at ECMWF by C. Cardinali and M. Fisher. Using this tool, we show the relative contribution of different GPS radio occultation observations in our operational numerical weather prediction model with respect to other data assimilated in the system.