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Assimilation of GPS data over Europe in Meteo France global forecasting system

P. Poli (1), P. Moll (1), F. Rabier (1), S. Healy (2), E. Andersson (2)

(1) Meteo France Centre National de Recherches Meteorologiques, Toulouse, France, (2) European Centre for Medium-Range Weather Forecasts, Reading, United Kingdom

The applications of Global Positioning System ground stations for meteorology have been explored for more than a decade. Today, data collected over Europe by this sensing technique are available to the operational meteorological centers in near real time, thanks to the work of the European project Targeting Optimal Use of GPS Humidity measurements in meteorology (TOUGH). Meteo France has made a preliminary assessment regarding the assimilation of these data into its global numerical weather prediction model. The data considered for assimilation are zenith total delays (ZTDs) which entangle two sources of meteorological information. These are namely the surface pressure at the station and the water vapour distribution above the station. The assimilation technique of the ZTD data will be discussed, along with the specific preprocessing technique developed for this end. The GPS ZTD data over Europe present several advantages: a high temporal resolution, perfectly known locations, and simultaneous processing by several centers which is unsual for meteorological data delivered in near real time. Assimilation and forecast experiments of European GPS ZTD data in the Meteo France global four-dimensional variational system (4DVAR) will be presented and discussed.