The utility of SAFRAN as analysis of near-surface atmospheric variables: the case of the snowstorm in Catalonia on 8th March 2010

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SAFRAN (Durand et al., 1993; Quintana-Seguí et al. 2008) is a mesoscale atmospheric analysis system for screen-level variables. It produces a meteorological analysis at the hourly time step using all available ground data observations and the outputs of a meteorological model, by means of optimal interpolation. One of its main features is that it is based on climatically homogeneous zones (areas where spatial gradients of meteorological variables are not very relevant) and it is able to reliably take their vertical variations into account.

We have implemented SAFRAN on the NE of the Iberian Peninsula (SAFRAN/NEIP). Currently, this project is being done in collaboration with AEMET, which provides us with all the available data from their synoptic and climatological networks and with the outputs of the HIRLAM meteorological model, to use as first guess. We have adopted the same grid as HIRLAM ($\sim$5 km of resolution). The first prototype of the system has benn implemented for the hydrological year September 2009 - August 2010.

In this contribution, we analyse the snow storm occurred on 8th March 2010 in Catalonia (in the northeast of Spain), with total amount that locally exceed 100 mm and snowfall amount of more than 40 cm measured in many places. In the Barcelona city as well as in the Girona province, this precipitation were joint to thunderstorm and strong gusts. This snowfall had an high impact in Catalonia, during the event because it created hazardous road conditions, and afterwards because of the problem in the electrical supply in the Girona province. The precipitation was unusual for the low snow level for the month and for the electrical activity during the thunderstorms. In particular this event was characterized by the "wet snow", a kind of snow that favours the accretion on the electric lines and may cause the breaking of the line and often an electrical failure.

The added value of the SAFRAN analysis system is to provide a mesoscale atmospheric knowledge of near-surface atmospheric variables in which the observations are checked for their quality and finally the output variables are consistent among them. This last point permits to calculate risk indices as the wind-chill or the probability of "wet snow".