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Extending the SAFRAN meteorological analysis system to the Iberian Peninsula and the Balearic Islands. Analysis of its performance and applications.

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Within the FP7 eartH_2Observe project we are studying the ability of different LSMs to simulate the processes of drought on the Iberian Peninsula. In order to perform our simulations we need a good atmospheric forcing dataset that covers the whole area of study at the right resolution (5 km in hour case). Currently, in Spain, there are some high resolution datasets, but none of them have all the variables necessary to run a LSM. Thus, we decided to extend the SAFRAN meteorological analysis system to the whole Iberian Peninsula and the Balearic Islands.

SAFRAN uses optimal interpolation to analyze the variables of interest using all available observed data (from AEMET's network) and a first guess (ERA-Interim). SAFRAN, which was developed by Météo France to force its LSMs (CROCUS for snow, ISBA and SURFEX for hydrological studies), was recently extended to the Ebro basin in a pilot study that covered only three years. In eartH_2Observe we are extending it to cover the 1995-2007 period. This period is not long enough to study climate variability, but it already useful to a range of studies that need a decade long dataset. In the future, we plan to extend SAFRAN to a period that covers several decades.

We present the SAFRAN analysis system, its main features and its performance in the study area. In addition, we also present a first comparison with alternative databases in the context of the eartH_2Observe Spanish Case Study. In the future, we expect SAFRAN to be useful, not only to large scale hydrology projects, but also to a large range of projects simulating land surface processes for other purposes. SAFRAN will also be useful as reference dataset for downscaling climate simulations. Thus, we also discuss these applications.