

# COMPARISON AND VALIDATION OF TWO METEOROLOGICAL ANALYSIS SYSTEMS IN THE NORTHEAST OF SPAIN

***QUINTANA SEGUÍ P. ()<sup>1</sup>, Peral García M. C.<sup>2</sup>, Turco M.<sup>3</sup>, Salas Pérez J. D. J.<sup>1</sup>, Llasat M. D. C.<sup>3</sup>, Martin E.<sup>4</sup>***

*<sup>1</sup>Observatori de l'Ebre, Roquetes, Spain*

*<sup>2</sup>Agencia Estatal de Meteorología, Madrid, Spain*

*<sup>3</sup>Universitat de Barcelona, Barcelona, Spain*

*<sup>4</sup>Météo-France, CNRS, Toulouse, Spain*

In this study, two meteorological analysis systems were compared and validated on the NE of the Iberian Peninsula. The first system is SAFRAN (Quintana-Seguí et al. 2008 and Vidal et al. 2010), which is based on optimal interpolation over climatically homogeneous zones (areas where spatial gradients of meteorological variables are not very relevant) and is able to reliably take vertical variations into account. SAFRAN is currently operational at Météo-France, as part of the SIM hydrometeorological suite (Habets et al. 2008). The second system is SPAN, which is the surface analysis of the HIRLAM Analysis and Forecasting System, running operationally at AEMET, the Spanish Meteorological Service, and the rest of HIRLAM countries. It was developed by AEMET as part of its contribution to the scientific plans of the NWP European Consortium HIRLAM. The study was done using subdaily data, for most variables, and daily data for precipitation, coming from AEMET's observational network of stations, covering the hydrological year Sept 2009 - Aug 2010. For all the tested variables (temperature, wind speed, relative humidity and precipitation), SAFRAN and SPAN are able to correctly reproduce the daily and the annual cycle, being SAFRAN's performance slightly better for all measures and variables, with one exception: it has a systematic bias of wind speed, which is very constant, and which is also present in the French version of the system. Both SAFRAN and SPAN produce similar spatial patterns, but there are some differences in very specific areas and seasons, mainly on the relief. In fact, it is in mountain areas where both systems have more problems. The implementation of

SAFRAN on this area is a first step belongs to our effort to build a distributed hydrological model for this area, similar to the French SIM hydrometeorological model. Through the implementation of SAFRAN and of a land-surface model (SURFEX .. ref.), it is possible to realize a number of future studies, which include the study of the hydrological cycle and the use of SAFRAN as an observational database for statistical downscaling of climate scenarios. These studies will be performed under the umbrella of the HyMeX program (<http://www.hymex.org>), which is studying the water cycle in the Mediterranean basin, and the SMOSCat project (<http://www.isardsat.cat/en/smoscat.html>), which plans to downscale SMOS soil-moisture data to a resolution of 1 km. In the latter project, the land-surface model SURFEX will help in validating the new soil moisture dataset.