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AEMET-ySREPS: The Spanish Convection-permitting LAM-EPS on AEMET forecasting offices

Alfons Callado-Pallarès, Juan José Gómez-Navarro, and David Gil-Oliva
(acalladop@aemet.es)

AEMET-*y*SREPS is a 2.5km multi-NWP models and multi-boundaries LAM-EPS system operating up to 72 hours since 2016 over Iberian Peninsula, Canary Islands and Antarctica Peninsula which is quite extensively used by AEMET forecasting offices. The main *y*SREPS goal is to improve operationally issued forecasts and warmings with a consistent measure of their predictability.

The *y*SREPS 20 members come up crossing four regional mesoscale non-hydrostatic convection-permitting NWP models: HARMONIE-AROME (ACCORD-HIRLAM), ALARO (ACCORD-ALADIN), WRF-ARW (NCAR-NOAA) and NMMB (NCEP-NOAA); with five Global NWP models' boundary conditions: ECMWF-IFS, NCEP-GFS, MétéoFrance-ARPÈGE, JMA-GSM (Japanese) and CMC-GEM (Canadian). Multi-model and multi-boundary approaches have been selected to take into account the NWP model and boundary condition uncertainties respectively. The combination of both prove to hold better skill-spread relationship than other EPS techniques based on uni-NWP models, especially for precipitation and/or convective High Impact Weather (HIW) events.

*y*SREPS has a big number of spatial and point products available for forecasting offices through an integrated visualisation framework called PANEL. Interestingly, the latter integrates them with other forecasting systems in AEMET such as deterministic HARMONE-AROME and ECMWF IFS and also its ensemble IFS-ENS, allowing forecasters to carry out a "poor man ensemble" conceptual prediction integration in order to issue the best possible predictions and warnings. Static spatial plots comprise mean, maximum and minimum fields, quartiles, probabilities, member "spaghettis" and EFI/SOT (Extreme Forecast Index). Precipitation "spaghetti" product depicting every member's contour precipitation in a number of distinct thresholds, are very appreciated in forecasting offices because it allows them to evaluate spatial uncertainty and look for possible extreme events represented only by a few members. Moreover, the new dynamic visualisation based on ADAGUC facilitates zoom up to a very local region for detailed forecasts. For point-based products, a new generation of meteograms (gSREPSgrams) which includes the most extreme single member are produced along the probabilistic vertical-profile product, which shows the most unstable member. Both products try to highlight possible extreme events.

The planned foreseeable evolution of AEMET-*y*SREPS system is to increase the number of members, incorporating more boundary conditions such as the ones from Global ICON, and including more mesoscale NWP models like ICON-LAM and GEM-LAM.