



Verification and spread/skill evaluation of a convection-permitting ensemble in dependence of the perturbation strategy.

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The COSMO-IT-EPS convection-permitting ensemble is based on the COSMO model run at a resolution of 2.2 km, aiming at providing probabilistic information in the context of operational forecast of mesoscale phenomena and severe weather over Italy. The ensemble starts its operational phase in 2017.

The strategy adopted in the ensemble construction includes the representation of different uncertainty sources: Initial Condition perturbation from a LETKF data assimilation, Boundary Condition perturbation from a coarser-resolution ensemble and perturbation of the COSMO model itself by combining the SPPT method and the perturbation of parameters of the physics schemes.

A comprehensive verification of the ensemble performance is here presented for a period of two months in different seasons, in dependence of the perturbation strategy. In particular, it is shown and discussed the role of the Initial Condition perturbations in determining the skill for high resolution precipitation forecast in presence of severe events.

The spread/skill relation of the ensemble is also presented, by using a novel approach to assess how the different perturbations affect the precipitation forecast, focussing on the perturbation of the physics schemes. The method permits to distinguish the impact of these perturbations on the uncertainty in the timing, in the amounts, in the structure and in the localization of the phenomena.