Dynamical downscaling of severe hydrometeorological events: the role of a stochastic parameterization for convection

E. Fiori (1), C. Keil (2), A. Parodi (1), N. Rebora (1), and G.C. Craig (2)

(1) CIMA Research Foundation, Savona, Italy, (2) Meteorological Institute, University of Munich, Munich, Germany

Flash flood-producing storms in the Mediterranean region are usually convective in nature and these phenomena are often responsible for severe hydrometeorological events with serious social and economic consequences.

To cope with this issue, a new dynamical-stochastic predictive chain has been implemented. This chain combines the limited area numerical weather prediction model COSMO, running at 7KM horizontal resolution with the Plant-Craig stochastic parameterization of cumulus convection, and the statistical downscaling procedure RainFARM to generate sub-grid variability of the precipitation field.

This predictive meteorological chain is evaluated using extreme events observed in 2006-2007 by a C-band polarimetric radar located in the North-Western Italy. Variability in the precipitation forecasts is quantified using total variance and spectral slope. The added value provided by the stochastic convection scheme and statistical downscaling is assessed by comparing to forecasts using a conventional cumulus parameterisation.