A probabilistic tool for meteorological prediction validation

L. Ferraris (1,2), E. Brussolo (1), J. von Hardenberg (3,1), A. Provenzale (3,1), N.Rebora (1)

(1) CIMA, via Cadorna 7, I-17100 Savona, Italy , (2) DIST, Via all'Opera Pia 13, I-16145 Genova, Italy, (3) ISAC-CNR, C.so Fiume 4, I-10133, Torino, Italy (email: nicola@cima.unige.it)

Errors in meteorological prediction represent one of the most important sources of uncertainty that propagates through a hydrometeorological forecasting chain. In this work we propose a new methodology for evaluating the reliability of precipitation forecasts produced by limited area models at different scales in space and in time. To this end, we use a stochastic downscaling model (RainFARM) which conserves the structure of the original deterministic prediction above given spatial and temporal reliability scales. We apply this downscaling procedure to selected LAMI forecasts over a study area covering North-Western Italy and we generate ensembles of high-resolution stochastic precipitation fields for a sequence of given reliability scales. The statistics of timeseries extracted from these stochastic fields at locations corresponding to a dense regional network of raingauges are compared with direct observations.