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Hydrological nowcasting: application and comparison of two probabilistic nowcasting technique

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Hydrological nowcasting is a useful instrument for improving the forecast of discharge in context as it is the Mediterranean area. Here, the massive number of small catchments with short hydrological response (in the order of few hours) makes necessary the anticipation of floods forecast to take actions with civil protection purpose. Nowcasting can improve the first hours of the precipitation forecast significantly gaining an anticipation in the flood forecast.
This work will present the comparison between two nowcasting technique used as input to the hydrological model. The first one, PhaSt, is operational at the Hydro-Meteorological Monitoring Centre of the Liguria Region. It is a spectral-based nowcasting procedure that, starting from precipitation fields provided by radar measurements, compute an empirical nonlinear transformation of them and stochastically evolves the transformed fields in spectral space. The second one, SBMcast, is the nowcasting algorithm used at CRAHI (Center of Applied Research in Hydrometeorology). This one, starting always from the most recent radar observations, it is based on the statistical model String of Beads. Both the nowcasting techniques provide an ensemble of equiprobable rainfall scenarios in a time horizon up to 3 hours and these are the main input to the continuous distributed hydrological model, Continuum.
The comparison between the two nowcasting methods has been performed analyzing the rainfall forecast and the hydrological forecast, on some case events that happened in Liguria Region, Italy, during 2014.