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Multi-model ensemble hydrometeorological modelling of the 4 November 2011 Genoa, Italy flash flood in the framework of the DRIHM project

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The FP7 DRIHM (Distributed Research Infrastructure for Hydro-Meteorology, www.drihm.eu, 2011-2015) project intends to develop a prototype e-Science environment to facilitate the collaboration between meteorologists, hydrologists, and Earth science experts for accelerated scientific advances in Hydro-Meteorology Research (HMR). In particular, the project includes the delivery of experiment suites designed to prove the full extent of the DRIHM e-Science environment capability. These experiment suites address the interdisciplinary and international challenges of HMR in forecasting severe hydro-meteorological events over complex orographic areas and assessing their impact.

Here the emphasis will be put on two experiment suites that have been set up and tested for the flash-flood event that occurred in Genoa, Italy on 4 November 2011. The first experiment suite focuses on rainfall forecasting and combines different numerical weather prediction models to form a high-resolution multi-model ensemble together with a stochastic downscaling algorithm. The second experiment focuses on river discharge prediction and combines different hydrological models as well as different rainfall sources (either from the first experiment suite or from observations) to form a multi-model ensemble. The composition of the first experiment suite with the second experiment suite represents a complete multi-model ensemble hydro-meteorological forecasting chain at the cutting edge of HMR. This presentation will demonstrate how progress beyond the state of the art has been achieved through the development and/or integration of tools that enable an easy comparison, combination, and visualisation of the different components of the hydro-meteorological forecasting chain.