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The CETEMPS Hydro-Meteorological chain during HyMex.

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During the HyMeX campaign (5 Oct – 6 Nov 2012) the Cetemps Hydrological Model (CHyM) has been offline coupled with weather forecast models WRF-ARW in order to estimate the possibility of flood occurrence.
CHyM is a distributed grid based hydrological model implementing an explicit parameterization of different physical processes contributing to hydrological cycle. The model is forced using temperature and precipitation forecast by WRF-ARW model. In addition two different alarm indices, providing a map of the stretches of rivers of the hydrological network where floods are more likely to occur, have been implemented into the model.
The WRF-ARW operational forecast chain is characterized by two domains running independently. A larger domain covering Europe has a horizontal resolution of 12 km using ECMWF analysis and forecast; the inner one covers Italy with a grid spacing of 3 km using as boundary and initial conditions the output from the WRF-ARW low resolution simulation. CHyM alarm maps are described and the results for three events occurred during HyMeX campaign are shown (IOP4, IOP18 and IOP19). These events are characterized by precipitation producing flash flood and/or an increase of the rivers level with heavy precipitation occurred over Central Italy (CI) and North East Italy (NEI). For CI the rainfall maxima reached more than 150 mm/24h producing floods over Marche and Abruzzo, during IOP4; 120-140mm/24hr are reached in the south side of Lazio region during IOP18. For NEI, 350mm/24h are accumulated during IOP19.
Emphasis is given to the possibility of coupling WRF and CHYM model providing an effective tool for operational flood alert mapping.