

## **Heavy Precipitation Events in the Mediterranean: A case study from HyMeX**

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Coastal regions of the northwestern Mediterranean basin are often struck by devastating high precipitation events (HPE), which occur predominantly in autumn. These events are usually associated with slow-moving trough, high CAPE values over the sea and a moist troposphere. Low level jets advect moisture from the sea towards the impacted coast. These unstable inflows together with lifting above orography or along convergence lines lead to deep convection and torrential rain.

Considerable efforts have been made in recent years to improve the skill of the forecasts for such severe events and significant progress was obtained thanks to the development of high-resolution convection permitting models. However, society's demands for predictive quality still remain largely unsatisfied and more accuracy is required, in terms of amount, timing, and location of rainfall. The following arguments are commonly put forward to explain the limited skill of Numerical Weather Prediction models: i) inaccuracy of initial and/or boundary conditions, ii) inappropriate representation of some physical processes or their interaction, and iii) intrinsic limitations on the predictability of atmospheric flows.

From a case study (24 September 2012), well observed during the first Special Observing Period of the Hydrological cycle in Mediterranean Experiment (HyMeX), the impact and relative contributions of these uncertainty factors are investigated using Meso-NH model output together with HyMeX observations. Special emphasize is put on the role of initial conditions which strongly control the location of the simulated precipitation.