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HYMEX: an experimental project to improve understanding and forecasting of Mediterranean high-impact weather events

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The Mediterranean basin has quite a unique character that results both from physiographic conditions and historical and societal development. The region features a near closed sea surrounded by very urbanized littorals and mountains from which numerous rivers originate. This results in a lot of interactions and feedbacks between oceanic-atmospheric-hydrological processes that play a predominant role on climate and its ecosystems. These processes frequently cause extreme events that produce heavy damages and human losses; heavy precipitation and flash-flooding during the fall season, severe cyclogeneses associated with strong winds and large swell or droughts accompanied by forest fires during summer are examples of Mediterranean high-impact weather events. The capability to predict such dramatic events remains weak because of the contribution of very fine-scale processes and their non-linear interactions with the larger scale processes. This will be illustrated at the conference for Mediterranean heavy precipitation events based on mesoscale data assimilation and kilometric scale modeling experiments.

There is a clear lack of an experimental project relying on up-to-date innovative instrumentation and high spatial density observations in order to go one step further in the understanding and predictability of the Mediterranean climate and associated high-impact weather events. The hydrological cycle in the Mediterranean region has been identified as a key scientific, environmental and socio-economic issue that has to be addressed within such an experimental future project, called HyMeX (HYdrological cycle in the Mediterranean EXperiment, http://www.cnrm.meteo.fr/hymex/). It

aims at a better quantification and understanding of the hydrological cycle and related processes in the Mediterranean, with emphases put on high-impact weather events and regional impacts of the global change including that on ecosystems and the human activities. A phasing of a special observing period with a THORPEX European Regional Campaign in 2011 in connection with the Medex Phase 2 is looked for. An overview of the scientific objectives of HyMeX will be presented at the conference as well as the ongoing prepatory actions for the experimental project.