Geophysical Research Abstracts, Vol. 9, 03966, 2007
SRef-ID: 1607-7962/gra/EGU2007-A-03966

Hydrological cycle in the Mediterranean experiment (HyMeX): Towards a major field experiment between 2009 and 2012

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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. Progress in the understanding of the Mediterranean climate has thus important environmental, societal and economical implications.

There is a clear lack of an experimental project relying on up-to-date innovative instrumentation in order to go one step further in the understanding and predictability of the Mediterranean climate and associated weather events. In France, the research commu-

nity has also recognised the necessity to develop a major multi-disciplinary and multi-scale experimental project to address the main issues related to the Mediterranean coupled system within the 2009-2012 period. 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 experimental project. The HyMeX (HYdrological cycle in the Mediterranean EXperiment, http://www.cnrm.meteo.fr/hymex/) project 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 the special observing period with a THORPEX European Regional Campaign in 2010 (or 2011) in connection with the Medex Phase 2 is looked for.

A white book for HyMeX is currently written by a panel of French scientists (listed here as co-authors) in atmosphere, hydrology and ocean sciences. It aims at highlighting some key open scientific questions related to the study of the water cycle at different time and temporal scales in the Mediterranean (water budget of the Mediterranean Sea, water resources and hydrological continental cycle, heavy precipitation and flash-flooding, deep water formation and coastal dynamics). It has been largely debated with the research community during the first HyMeX workshop in January 2007, and has constituted one of the opportunities to discuss and integrate propositions of the international community.