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THE AEROSOL DIRECT RADIATIVE IMPACT IN THE MEDITERRANEAN (ADRIMED) PROJECT

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Résumé :

The Mediterranean region has been identified as one of the most prominent “Hot-Spots” in future climate change projections with a substantial precipitation decrease and warming. Presently, most of climate simulations have been conducted from coarse resolution Global Climate Model (GCM) limiting their capability to capture mesoscale features and thus the confidence we can have in results produced over such complex regions as the Mediterranean, especially concerning the influence of the various (mineral dust, smoke, sea salt, pollution) Mediterranean aerosols that significantly modify its radiative budget. The general goal of the ADRIMED (Aerosol Direct Radiative Impact on the regional climate in the MEDiterranean region) project is to assess the impacts of the direct and semi-direct radiative effect of aerosols on the regional climate of the Mediterranean. ADRIMED is part of the international ChArMEx (the Chemistry-Aerosol Mediterranean Experiment) program.

The ADRIMED strategy is based on an integrated approach combining an intensive experimental field campaign over Western Mediterranean during summer (June-July) 2013 including in-situ surface at two super (Lampedusa and Cape Corsica) and secondary (Minorca, Granada) sites, aircrafts (ATR and F20 aircrafts) and spaceborne observations associated with meso-scale and regional climate models (RCM) particularly adapted to capture the high complexity of the Mediterranean.

The database obtained during the experimental campaign will be used to evaluate the ability of meso-scale and regional climate models to reproduce aerosol microphysical, optical properties, vertical structure, influence on SW-LW radiations and the direct, semi-direct radiative forcings. Simulations will be first conducted for aerosol events occurring during summer 2013. Secondly, RCM (RegCM4 and ALADIN-Climat) long-term simulations for past-present climate conditions will be conducted for evaluating the influence of the direct and semi-direct radiative effect of aerosols on the Mediterranean climate.

We propose here to present the main objectives and the methodology of the ADRIMED project with a focus on the different meso-scale and regional climate models involved in this project and the first results obtained for the summer 2013 period and long-term simulations.

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