Geophysical Research Abstracts
Vol. 20, EGU2018-8915, 2018
EGU General Assembly 2018

The RegCM4 high-resolution mini-ensemble: case studies to explore the ICTP regional climate model response in convection-permitting mode over the Mediterranean

Emanuela Pichelli (1), Erika Coppola (1), Filippo Giorgi (1), Michal Belda (2), Ivan Guettler (3), Tomas Halenka (2), and Lidija Srnec (3)

(1) Abdus Salam International Centre for Theoretical Physics, Earth System Physics , Trieste, Italy (pichelli@ictp.it), (2) Charles University, Dept. of Atmospheric Physics, Faculty of Mathematics and Physics, Prague, Czech Republic, (3) Meteorological and Hydrological Service (DHMZ), Zagreb, Croatia

Progresses in computing performances now allow for climate simulations at high resolution, more specifically at the so called convection-permitting scale. Investigation about past and future climate over the Mediterranean area and in particular about its local-scale mechanisms, as well as their mutual interactions, is of major interest and motivates the effort of the research community involved in one of the project of the Coordinated Regional Downscaling Experiments Flagship Pilot Studies program (CORDEX-FPS). The ICTP regional model RegCM4 contributes to this effort; selected cases studies have been simulated and compared to observations to investigate model capability to reproduce severe events scenarios over the Mediterranean, with a particular focus on convective systems evolution. A RegCM ensemble of differently configured simulations has been completed to assess the sensitivity of heavy precipitation events to land-surface and microphysics schemes, showing that use of more sophisticated parameterizations (multilayer for surface, prognostic multiple-phase for microphysics) allow to improve model performances in simulating convective events in terms of both evolution and rain distribution. Some key aspects have been considered for the analysis of successfully and unsuccessfully simulated cases: the role of low resolution (12 km) guiding conditions and the possible added value from convection permitting scale (3 km) for climate studies have been investigated. A preliminary analysis shows that the model under-catches convective events driven by complex mesoscale interactions or driven by weak large scale forcings, but model results may be improved by using soil-moisture initialization.