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RegCM CORDEX-atlas simulations: experiment setup, model validation and future projections for two scenarios (RCP2.6; RCP8.5) over 9 CORDEX domains.

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The Coordinated Regional Climate Downscaling Experiment (CORDEX) (Giorgi et al. 2009) moved towards the implementation of its phase 2 (hereafter referred to as CORDEX2, Giorgi and Gutowski 2015).
One initiative of this phase II is CORDEX-CORE, by which a minimum set of regional climate models (RCMs) downscaled a common set of Global Climate Model (GCM) scenario simulations over most CORDEX domains. The downscaled simulations will have a spatial resolution spanning from 12 to 25 km and will cover the 140-year period 1960-2100 for multiple greenhouse gas representative concentration pathways (RCP). The scientific aim of this ambitious project is to provide homogenous downscaled climate change information across the globe, which will lead to increased understanding of the variability and change of regional climate phenomena; to a more rigorous evaluation and improvement of downscaling techniques; and to the production of a high quality homogenous dataset for impact and vulnerability studies and for use by stake-holders and decision makers.
As part of the CORDEX-CORE program, RegCM user community completed an ensembles of scenario simulations with the RegCM4 system over 9 CORDEX domains. Such effort has been distributed across various users and the ICTP directly contributed to it by carrying out the experiments for a sub-set of the CORDEX domains. Specifically, scenario projections have been completed for six CORDEX domains: the African, North, Central and South American, the pan European ones and the Australasia. Two scenario (RCP 8.5 and 2.6) are downscaled driven by a minimum of 3 GCMs for 130 years at a horizontal grid spacing of 25 km for all region except Europe where a 12km resolution has been used.
The aim of this work is to provide a critical contribution to the next generation assessments of impacts and vulnerabilities worldwide. Toward this direction all the simulations have been validated for the refernce period and added value has been shown for wet and dry extremes in several region of complex topography or where land surface feedback plays a n important role like for example the Amazon forest. Added value is also seen for wind intensity, cyclon track simulation and position and intensity of several jeat streams. Climate change (CC) signals are compared with the same signals coming from the GCM and regional specific feature are evident for both the mean and extreme analysis. In the regions and for those processes where added value is found in the control period, the regional climate change signal departs more from the large scale CC signal coming from the GCM. Process oriented analysis will be presented for each of the 9 CORDEX regions.