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High resolution climate change simulations over ten CORDEX-CORE Domains using the regional climate model REMO

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As a response to the IPCC needs for coordinated high resolution simulations, the WCRP Initiative on CORDEX designed a framework to perform an ensemble of regional climate models covering major land-masses of the globe at a high spatial resolution of 25 km. This CORDEX Coordinated Output for Regional Evaluation (CORE) framework will produce a baseline set of homogeneous high-resolution dynamically downscaled projections forced by selected global climate models and two representative concentration pathways scenarios (low- and high-end scenario).

The latest version of the regional climate model REMO, which was developed at the Climate Service Center Germany (GERICS), was used to simulate the present and future climate of ten CORDEX-CORE domains out of the fourteen CORDEX Domains: Europe, South America, Central America, North America, Africa, South Asia (formerly called West Asia), Australasia, East Asia, Central Asia, and Southeast Asia. Following the CORDEX-CORE setup, the model was run on a spatial resolution of 0.22° (about 25 km) with 27 hybrid vertical levels. The simulations compose of the evaluation period driven by the ERA-Interim from 1979 to 2017 and the two RCPs scenarios (RCP2.6 and RCP8.5) driven by three GCMs (MPI-ESM-LR, HadGEM2, and NorESM) for the period 1950 to 2100.

The mean precipitation and temperature bias, annual cycle, and model skill were analysed using the latest CRU version TS 4.02 during the evaluation period (1981 to 2010). The regions of analysis were defined based on the fourteen climate types from the Koeppen-Trewartha Climate Classification. We identified the regions where the model has relatively high or low skill in simulating the climate of the regions. The first results of the climate change simulations (1971 to 2010) done by REMO over the ten domains will also be shown. These high-resolution simulations will be provided as contribution for the CORDEX-CORE ensemble.