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Evaluation of global and regional climate simulations over Africa

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Two ensembles of climate simulations, one global and one regional, are evaluated and inter-compared over the Africa-CORDEX domain. The global ensemble includes eight coupled atmosphere ocean general circulation models (AOGCMs) from the CMIP5 project with horizontal resolution varying from about 1º to 3º, namely CanESM2, CNRM-CM5, HadGEM2-ES, NorESM1-M, EC-EARTH, MIROC5, GFDL-ESM2M and MPI-ESM-LR. In the regional ensemble all 8 AOGCMs are downscaled over the Africa-CORDEX domain at the Rossby Centre (SMHI) by a regional climate model – RCA4 at 0.44º resolution. The main focus is on ability of both global and regional ensembles to simulate precipitation in different climate zones of Africa. Precipitation climatology is characterized by seasonal means, inter-annual variability and by various characteristics of the rainy season: onset, cessation, mean intensity and intra-seasonal variability. To see potential benefits of higher resolution in the regional downscaling all precipitation statistics are inter-compared between the individual AOGCM-RCA4(AOGCM) pairs and between the two multi-model ensemble averages. A special attention in the study is on how the AOGCMs simulate teleconnection patterns of large-scale internal variability and how these teleconnection pattern are reproduced in the downscaled regional simulations.