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Dynamical downscaling of CMIP5 GCM simulations over the Africa-CORDEX domain: Evaluating climate variability for the recent past

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The World Climate Research Program (WCRP) sponsors the CORDEX project (Coordinated Regional Downscaling Experiment) which aims to produce detailed regional climate data for all land regions of the world in support of climate change impact and adaptation research. The Rossby Centre has performed a suite of dynamical downscaling simulations over the Africa-CORDEX domain, using a new version of the RCA4 model forced by six Coupled GCM simulations from the CMIP5 archive. All simulations cover the period 1950-2100 and are run in transient mode. Here we present an analysis of climate variability over the Africa-CORDEX domain as simulated by RCA4 driven by the six GCMs, focussing on the historical period 1950-2005. Results are compared to an equivalent RCA4 simulation employing ERA-interim boundary and surface forcing for the period 1979-2010 and to the respective GCM forcing data. We investigate the degree of coherency between RCA4 and the GCM/ERA-interim boundary data at larger scales, as well as the potential added-value from the higher resolution of RCA4 at smaller scales. The latter assessment concentrates on simulated precipitation variability, in particular extended dry periods, intra-seasonal variability, rainy season onset and decline and intense precipitation events. This analysis forms a reference to which projected climate changes from RCA4 over Africa can be contrasted.