

# Representation of Southern African Monsoon In A High-Resolution AGCM and Its Future Projections

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A monsoon circulation exists over the southern part of the African continent during the austral summer with precipitation maximum stretching from Angola on the west coast of southern Africa to Madagascar. In some locations, southern African monsoon lasts up to six months. Studies about this monsoonal circulation are surprisingly sparse. To understand the mechanism involved in the development of Southern African Monsoon and its controls, the present study uses a high-resolution AGCM, High-resolution Atmospheric Model (HiRAM) which is developed at GFDL. Accurate simulation of the migration of ITCZ is crucial in the simulation of rainfall over Southern Africa. HIRAM simulations, which are conducted at ~25 km horizontal resolution, can simulate the structure and migration of ITCZ with sufficient accuracy. The seasonal cycle, spatial structure, and the associated dynamic features are examined. The study incorporates observations, gridded datasets, reanalysis products, and GCM simulations for this purpose. Additionally, the future projections using representative concentration pathways RCP 4.5 and RCP 8.5 are also conducted and analyzed.

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