

Impact of the Indian part of the summer MJO on West Africa using nudged climate simulations

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Observational evidence suggests a link between the summer Madden Julian Oscillation (MJO) and anomalous convection over West Africa. This link is further studied with the help of the LMDZ atmospheric general circulation model. The approach is based on nudging the model towards the reanalysis in the Asian monsoon region. The simulation successfully captures the convection associated with the summer MJO in the nudging region. Outside this region the model is free to evolve. Over West Africa it simulates convection anomalies that are similar in magnitude, structure, and timing to the observed ones. As the observations, the simulation shows that 15 to 20 days after the maximum increase (decrease) of convection in the Indian Ocean there is a significant reduction (increase) in West African convection. The simulation strongly suggests the westward propagation of a Rossby equatorial wave as the main mechanism for this link. These results highlight the use of MJO events to potentially predict regional-scale anomalous convection and rainfall spells over West Africa with a time lag of approximately 15 to 20 days.