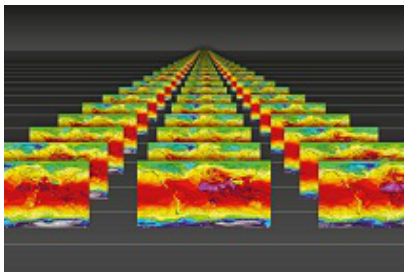

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Performance evaluation of an S2S model in predicting rainfall onset over West Africa

The present study evaluates the performance of an S2S model (called CMA: the China Meteorological Administration) in simulating RODs over West Africa. Using two ROD definitions, we compared the model ROD at six lead-time forecasts (10, 20, 30, 40, 50 and 60 days) with the observed ROD from satellite datasets, statistically quantify model capability to reproduce the inter-annual variability of RODs over the climatological zones in the sub-continent, and investigated how well the model links RODs with the dynamics of monsoon system over the sub-region. The observation shows that the mean RODs follow a latitudinal progression, and the dates increases northward from the coast. The performance of the S2S model in reproducing RODs largely depends on the definition used. For instance, the ability of the model to replicate the observed spatial pattern of RODs and all the essential features over the three zones in West Africa is stronger with DEF1 than DEF2. Regardless of the ROD definition used, the 20- to 60-day forecasts produced realistic simulation than the 10-day forecast. We also found that the performance of the model in reproducing the inter-annual variability of RODs depend on the zones (Guinea, Savanna and Sahel). Moreover, the model could reproduce the three main phases of the West African Monsoon (WAM: the onset, peak and the southward retreat of rainfall) and other dynamics. The study again shows that the ability of the S2S model to simulate RODs over the sub-region is strongly linked to how well the model capture the northward movement of the monsoon system and the associated moisture inflow over the sub-region. The results of the study have revealed that the CMA S2S model could replicate the characteristics of RODs over West Africa, even in lead times of about 20 to 30 days.
Keywords: Monsoon, Precipitation, Reforecast, Sub-region, Simulation.

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