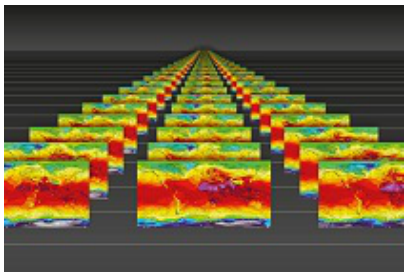

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Understanding the influence of global climate drivers on monsoon onset variability in Nigeria using S2S models

Abstract

This study is inspired by the huge economic implications of rainfall onset in Nigeria. It accessed and evaluate, the skills of CMA, ECMWF and UKMO Sub-Seasonal to Seasonal (S2S) models in predicting monsoon onset, its variability, the global drivers modulating the variability and the Tele-connections of the drivers with the variability of the onset anomaly in Nigeria. All the models, their ensemble members with the observation were subjected to quantitative statistical analyses. Results show that all the three models captured the evolution and variability of the global drivers modulating the monsoon onset. However, only the ECMWF model was able to produce of the strength, the spatial and temporal position of both the AEJ and the TEJ. Results also suggest that the understanding of the tele-connection of most global drivers especially the ITD may require further investigation. However, the tele-connection of the SST over the Central Pacific is better, especially with the onset anomaly over both the Gulf of Guinea and the Sahel. Furthermore, results show that each of the models exhibit a unique and different characteristics over Nigeria in predicting the rainfall onset. Basically, the three models are able to simulate the Northwards migration of the onset dates adequately with inherent biases.However,Despite the poor performance of the models in predicting the variability of onset anomaly, over the Gulf of Guinea and the Sahel, there is a considerable improvement in the correlation skill of the models over the Savannah. Although, the CMA model might have the least skill, it is however showed that all the S2S models despite the inherent biases, are able to predict rainfall onset over Nigeria, within the sub-seasonal time scale. Finally the results show that improvements in multi-model ensembles is a valuable added information able to significantly improve model performance.

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