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THE SKILL OF MONSOON RAINFALL MULTIWEEK PREDICTION OVER MOZAMBIQUE IN THE SUBSEASONAL TO SEASONAL (S2S) PROJECT DATABASE

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ABSTRACT: Situated in Southern Africa (Africa south of 10°S), Mozambique is a country with ~28 million inhabitants, 65% of whom living in rural areas and whose subsistence heavily relies on agriculture. Besides, most of the energy consumed in the country comes from hydropower generation. The success of both agriculture and hydropower generation, the key sectors to the development of the country, strongly depends on availability of water resources, supplied in the country mainly by the monsoon rainfall, which usually occurs during December-January-February (DJF) season. However, the monsoon rainfall besides undergoing year-to-year variation in its distribution, it also shows significant intraseasonal variability, characterized by active and break periods. Thus, besides the prediction of overall strength of monsoon rainfall in a particular year, it is also important predicting its active and break episodes as their knowledge is of great societal and economical value in the highly populated Mozambique provinces. This is particularly true during the monsoon season, when frequent extreme events occur, such as persistent heavy rainfalls associated sometimes with tropical cyclones. In this line, this study uses the European Centre for Medium-Range Weather Forecasts (ECMWF) and the National Centers for Environmental Prediction Climate Forecast System version 2 (CFSv2) models hindcasts to examine the skill of multiweek prediction of Mozambique monsoon precipitation within the sub-seasonal to seasonal prediction project (S2S) common period (1999-2010). Preliminary analysis of these models results against the Climate Prediction Center gridded precipitation dataset and the ECMWF ERA-Interim reanalysis shows that the predictive skill of precipitation and its associated large-scale circulation in term of correlation is useful out to a lead time of about 2 weeks. Although the ECMWF outscores CFSv2, both models are able to reproduce reasonably well the observed modulation of Mozambique monsoon precipitation by the Madden–Julian Oscillation (MJO)–the main source of predictability at subseasonal time-scale. These results suggest that overall the state-of-the-art operational S2S models have the capability to provide useful monsoon rainfall predictions for Mozambique and neighbouring regions.

Keywords: Monsoon rainfall. Mozambique. S2S models. Predictive skill. MJO Monsoon rainfall. Mozambique. S2S models. Predictive skill. MJO.

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