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Prediction and Monitoring of Monsoon Intraseasonal Oscillations over Indian Monsoon Region in an Ensemble Prediction System using CFSv2

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An ensemble prediction system (EPS) is devised for the extended range prediction (ERP) of monsoon intraseasonal oscillations (MISO) of Indian summer monsoon (ISM) using NCEP Climate Forecast System model version2 at T126 horizontal resolution. The EPS is formulated by producing 11 member ensembles through the perturbation of atmospheric initial conditions. The hindcast experiments were conducted at every 5-day interval for 45 days lead time starting from 16th May to 28th September during 2001-2012. The general simulation of ISM characteristics and the ERP skill of the proposed EPS at pentad mean scale are evaluated in the present study. Though the EPS underestimates both the mean and variability of ISM rainfall, it simulates the northward propagation of MISO reasonably well. It is found that the signal-to-noise ratio becomes unity by about18 days and the predictability error saturates by about 25 days. Though useful deterministic forecasts could be generated up to 2nd pentad lead, significant correlations are observed even up to 4th pentad lead. The skill in predicting large-scale MISO, which is assessed by comparing the predicted and observed MISO indices, is found to be $\sim$17 days. It is noted that the prediction skill of actual rainfall is closely related to the prediction of amplitude of large scale MISO as well as the initial conditions related to the different phases of MISO. Categorical prediction skills reveals that break is more skillfully predicted, followed by active and then normal. The categorical probability skill scores suggest that useful probabilistic forecasts could be generated even up to 4th pentad lead.