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Title: Sub-monthly Forecast Skill from Global Ensemble Prediction Systems

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Abstract:

The prediction skill of precipitation over sub-monthly time scale is investigated based on hindcasts from three global ensemble prediction systems (EPS). The results valid for up to four weeks indicate good skill or predictability over some regions during the boreal summer monsoon season (e.g, June through September), particularly over southeastern Asia and the maritime continent. The hindcasts from all the three models correspond to high predictability over the first week compared to the following three weeks. The ECMWF forecast system tends to yield higher prediction skill than the other two systems, in terms of both anomaly correlation and mean squared skill score. ^M

^M

The sources of sub-monthly predictability are examined over the maritime continent with focus on the intra-seasonal MJO and interannual ENSO phenomena. Rainfall variations for neutral-ENSO years are found to correspond well with the dominant MJO phase, whereas for moderate/strong ENSO events, the relationship of rainfall anomaly with MJO appears to become weaker, while the contribution of ENSO to the sub-monthly skill is substantial. However, there is exception that if a moderate/strong MJO event propagates from Indian Ocean to the maritime continent during typical ENSO years, the MJO impact can become overwhelming, regardless of how strong the ENSO event is. These results support the concept that 'windows of opportunity' of high forecast skill exist as a function of ENSO and the MJO in certain locations and seasons, that may lead to subseasonal to seasonal forecasts of substantial societal value in the future.

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