

## **Forecast skill of Madden-Julian Oscillation events in a global nonhydrostatic model during the CINDY2011/DYNAMO observation period**

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Near real-time week-long forecasts of Madden-Julian Oscillation (MJO) events using a regionally stretched global nonhydrostatic model have been executed for the intensive observation period of the field program, Cooperative Indian Ocean experiment on intraseasonal variability in the year 2011 (CINDY2011) / Dynamics of the Madden-Julian Oscillation (DYNAMO). The forecast skill was validated by real-time multivariate MJO index (RMM) and horizontal and temporal variations of outgoing longwave radiation, zonal velocities at 200 and 850 hPa. Systematic errors were found in the amplitude and phase of MJO, especially in the period of weak amplitude. The errors grew typically after 3 days of integration with dominance of planetary scale. The errors were partly attributed to coarse resolution over the central Pacific, and more essentially to excessive development of circulation (low-level convergence and upper-level divergence) for a given convective anomaly. These results suggest that realistic large-scale relationship between convection and circulation is crucial to improvement in the MJO forecast skill even in cloud-resolving models, which may not necessarily be guaranteed by high performances in mesoscale forecasts.