

Nasuno, T., K. Kikuchi, M. Nakano, Y. Yamada, M. Ikeda, and H. Taniguchi, 2017: Evaluation of the near real-time forecasts using a global nonhydrostatic model during the CINDY2011/DYNAMO. *J. Meteor. Soc. Japan*, **95**, 345-368.

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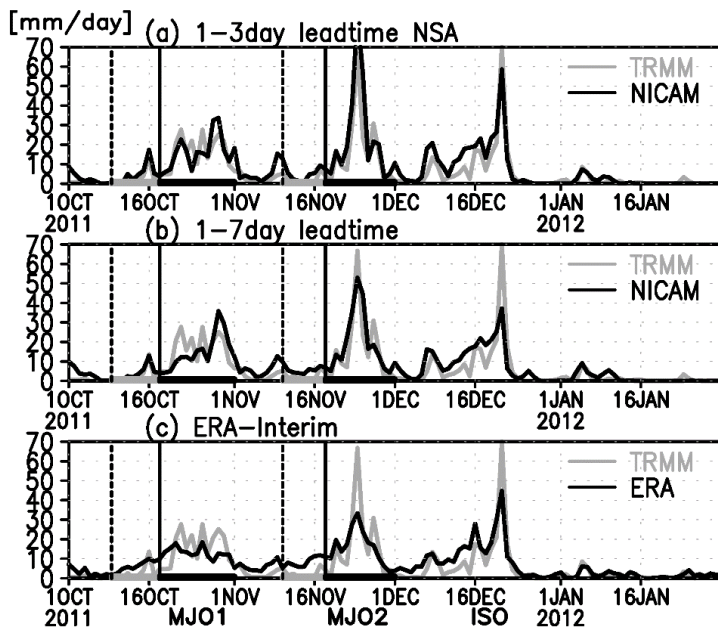


Figure 1. Time series of daily precipitation averaged in the northern sounding array (73° – 80° E, 0° – 5.5° N) in the NICAM forecasts (black) for (a) 1–3-day and (b) 1–7-day lead time average, and (c) ERA-interim (black) in comparison with TRMM 3B42v7 (gray).

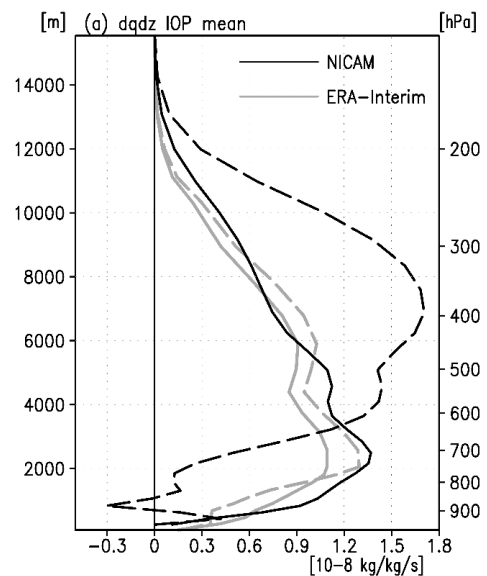


Figure 2. Vertical profiles of vertical advection of moisture using the 6-hourly (dashed lines) and 7-day-mean (solid lines) variables in the NICAM simulations (black) and ERA-interim (gray), averaged in the equatorial Indian Ocean domain (60° – 90° E, 10° S– 10° N) for the observation period.

- The near real-time forecasts using Nonhydrostatic Icosahedral Atmospheric Model (NICAM) for the CINDY2011/DYNAMO were evaluated in comparison with observations. A week-long forecast was run each day with the finest mesh size of 14 km over the tropical Indian Ocean.
- The simulated precipitation time series fairly represented the sharp contrast associated with the MJO events (Fig. 1), although a 30% overprediction of precipitation was found on average. Frequencies of strong ($>40 \text{ mm day}^{-1}$) precipitation were overpredicted, while those of weak precipitation were underpredicted against satellite observations. Compared with the sounding observations, lower to middle tropospheric dry ($\sim 1 \text{ g kg}^{-1}$) and warm ($\sim 1 \text{ K}$) biases were found.
- The moisture and energy budgets were investigated using the forecast data. The diagnosis using the 7-day-mean fields captured the observed features of the MJO events. Meanwhile, significant upward transport of moisture by the grid-resolved high-frequency variability was detected throughout the period (Fig. 2), which was markedly different from the diagnosis using ERA-interim (Fig. 2, gray lines). The high-frequency effects in NICAM partly accounted for the above mentioned performance and the moistening in the preconditioning period of the MJO.