Current status of subseasonal simulations using ocean coupled NICAM (NICOCO)

*Tomoki Miyakawa[1]

1.Atmosphere and Ocean Research Institute, The University of Tokyo

NICAM has demonstrated its potential as an atmospheric model in producing realistic MJOs in terms of eastward propagation speed and spatial precipitation patterns (Miura et al. 2007, Miyakawa et al. 2014). Ocean-surface boundary conditions for NICAM had been either prescribed SSTs or mixed-layer 1D ocean model in these studies. Recently we developed a coupler that connects the Icosahedral grid-system of NICAM with a Tri-polar grid system applied in an ocean model COCO, which has been used extensively as the ocean component of MIROC. The ultimate target of the ocean coupling is to enable long-term climate predictions, which require additional effort for adjustment and verification along with a large amount of computational resource. However in the short term, we seek to utilize the ocean coupled NICAM (NICOCO) to improve sub-seasonal to seasonal predictions, and deepen our understandings in the interactions between MJO and ocean. The pilot study of NICOCO includes the evaluation of ocean coupling impacts on 1) interaction between MJO and ENSO, 2) interactions between MJO and oceanic waves and/or through flows in the Maritime continent warm pool regions, and 3) Australian monsoon onset. Model features and preliminary results will be introduced.

References:
Miura,H., Satoh, M., Nasuno, T., Noda, A.T., Oouchi, K. (2007): A Madden-Julian Oscillation event realistically simulated by a global cloud-resolving model. Science, 318, 1763-1765.
Miyakawa, T., Satoh, M., Miura, H., Tomita, H., Yashiro, H., Noda, A. T., Yamada, Y., Kodama, C., Kimoto, M., Yoneyama, K., 2014: Madden-Julian Oscillation prediction skill of a new-generation global model. Nature Commun., 5, 3769. doi:10.1038/ncomms4769.

Keywords: NICAM, Ocean coupled model, global nonhydrostatic model

