

Overview of global scale large ensemble simulations using NICAM on Fugaku

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The world's new #1 supercomputer Fugaku is made available to a limited group of programs for promoting researches, including the "Large Ensemble Atmospheric and Environmental Prediction for Disaster Prevention and Mitigation". Theme 2 of this program targets extended-range (from over a week to several months) predictions of high-impact weather events, using the global cloud/cloud-system resolving model NICAM and its ocean-coupled version NICOCO. This target requires good model performance in producing not only the high-impact weather events themselves, but also largescale, longer lived fluctuations of MJO/BSISO, ENSO, etc., by which the events are influenced. In this talk, we will provide an introductory overview of the activities and prospects of theme 2.

Typhoon is the primary high-impact weather event targeted in the theme. It is being investigated what merit large-sized ensembles can provide in predicting their track and intensity (~1000 members for 14 km mesh and 30~100 members for 3.5 ~ 7 km meshes, initial conditions provided by NEXRA system). Sub-seasonal reproducibility and mechanism of MJO/BSISO are being investigated as part of an intercomparison project for global storm resolving models (DYAMOND2), and through large-ensemble sensitivity studies. The increased computational power enables us to gain a clearer view of the model climatology, which is also a key requirement in producing extended-range prediction. The roles of ocean, e.g., local air-sea interactions, western boundary currents, and ENSO, are being taken into account using NICOCO.

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