

ACG032-05

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Global cloud-system resolving simulation data using NICAM

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Global cloud-system resolving numerical model (GCRM) is a very useful tool to investigate atmospheric phenomena associated with cloud and precipitation on the whole globe. Nonhydrostatic Icosahedral Atmospheric Model (NICAM) is the first GCRM in the world that is designed for this purpose. NICAM has been operated using the mesh size of 3.5 km for week-long simulations and 7-14 km for seasonal simulations on the Earth Simulator. We have already performed several series of NICAM simulations and opened the data to international and domestic collaborators. We are also tackling finer mesh size simulations and extension of integration period on the state-of-the-art supercomputers. The major focus of our studies using the NICAM data has been on diurnal to seasonal scale atmospheric phenomena in the tropics (e.g., diurnal variation of precipitation, intraseasonal variability, Madden-Julian Oscillation, tropical cyclogenesis, seasonal march of Asian summer Monsoon), and we can expect new perspective on these subjects with upgraded computational equipments. There also will be new research areas where the NICAM simulation data has high potential (e.g., extratropical phenomena).

As to the evaluations of the model, we have been keen on validating cloud and precipitation properties in comparison with satellite data, and based on the evaluations, improved the model physical processes (e.g., cloud microphysics, turbulent processes). Now, it is high time to make combined use of NICAM simulation data and recently released observational and analysis data for research activity and ultimate validation of the model. Especially, land-surface and atmosphere-ocean processes, which are highly relevant to seasonal and regional variabilities, will be of key processes.

In the presentation, overview of research results using NICAM and available simulation dataset will be introduced, as a prelude to future collaborations.

Keywords: global cloud-system resolving simulation data, NICAM