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Diamond-NICAM-SPRINTARS: simulations on the Fukushima radiation transport

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A Development of Seamless Chemical AssimiLation System and its Application for Atmospheric Environmental Materials (SALSA) project is focused on creating a regional (local) scale assimilation system that can accurately recreate and predict a transport of carbon dioxide and other air pollutants. In this study, a regional model of the next generation global cloud-resolving model NICAM (Non-hydrostatic ICosahedral Atmospheric Model) (Tomita and Satoh, 2004) is developed, which is called a Diamond-NICAM, and ran together with a transport model SPRINTARS (Spectral Radiation Transport Model for Aerosol Species) (Takemura et al, 2000) to simulate aerosols across urban cities (over a Kanto region including metropolitan Tokyo). This enables us to see the effects of warming, pollutants and urbanization to the change in a local climate.

However, for this presentation, we will shift the focus to simulations on the Fukushima radiation transport, recreating a map of radiation spread by analyzing a sulfate transport on the same models(Fig.1). What we are hoping to achieve here is to verify an accuracy of running a finer resolution Diamond-NICAM-SPRINTARS model on transporting an aerosols, as the model is rather new and has not been tested in such occasion. Also, looking at a use of sulfate transport when simulating a radiation transport will be mentioned.

Finally, we will look at and compare a difference between Diamond-NICAM-SPRINTARS and global NICAM-SPRINTARS, and discuss advantages and shortcomings of the models, especially on the accuracy and the time constraints when a finer resolution is applied; also effects of boundary conditions in a regional model is discussed.

Keywords: Diamond-NICAM, Regional model simulations