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Okazaki heavy rainfall reproduced by LETKF nest system

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Okazaki heavy rainfall that occurred on 28-29 Aug. 2008, was simulated by the Local Ensemble Transform Kalman Filter (LETKF) nest system. The LETKF nest system is composed of outer and inner LETKFs to reproduce the mesoscale-convergence and the observed large rainfall amount, simultaneously. In this experiment, the grid intervals of the inner and outer LETKFs were 15 km and 1.875 km, respectively. The boundary data of the inner LETKF was produced by the interpolation of the outputs of the outer LETKF, which is similar manner of down scale experiments. The analyzed fields of the outer LETKF were modified by those of the inner LETKF every 6 hours. The conventional data of Japan Meteorological Agency, such as upper sounding data, were assimilated in both LETKFs.

When ensemble forecasts were conducted by LETKF nest system, the line-shaped rainfall systems were reproduced in most of ensemble members, though their positions and rainfall intensities were varied among the members. Besides the probability of the generation of the intense convection systems, the relationships between the rainfall and other variables, such as water vapor flux and low-level and middle-level equivalent potential temperature, can be investigated with the outputs of the ensemble forecasts. In the presentation, the outline of LETKF nest system, the structure of the rainfall system of Okazaki heavy rainfall and the relationship between the rainfall and other variables will be explained.

Keywords: Heavy rainfall, Ensemble Kalman Filter