High-resolution global atmospheric data assimilation experiments with an ensemble Kalman filter

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It is crucial to develop a numerical weather prediction system including data assimilation in order to predict the extreme weather such as heavy rainfalls and typhoons in the post-K era. We have been developing the NICAM-LETKF system to assimilate the conventional observations, satellite microwave radiances from AMSU-A (Advanced Microwave Sounding Unit-A), and satellite-based global precipitation data GSMaP (Global Satellite Mapping of Precipitation). The NICAM-LETKF may be run at very high resolution, or may provide boundary conditions for even higher resolution systems. Improving the NICAM-LETKF performance is at the center of enhancing mesoscale predictability for better preparedness for severe weather events well in advance.
 Data assimilation experiments have been conducted with NICAM-LETKF at 112- and 28-km horizontal resolution with 100 ensemble members. Higher resolution experiment can reproduce the precipitation field well by assimilating precipitation observations. We need to keep improving the physical and computational performances of NICAM-LETKF to increase the resolution and the ensemble size, and to assimilate "Big Data" from the next-generation observations.

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