

Preliminary results of observing system simulation experiment (OSSE) for future space-based Doppler wind lidar

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Space-based Doppler Wind Lidar (DWL) can provide global wind profiles that are significantly beneficial for the numerical weather prediction. The feasibility of DWLs has been investigated using OSSE. Our DWL OSSE features a realistic simulation of Lidar scattering from 3-dimensional, hourly aerosol that is consistent to wind field and created by a full-brown lidar simulator. The aerosol is produced by a global aerosol chemical transport model developed by MRI in which wind field is nudged with pseudo-truth. The pseudo-truth atmospheric field is generated from the Sensitivity Observing System Experiment (SOSE) approach. Simulated line-of-sight wind speeds are assimilated with the four-dimensional variational (4D-Var) scheme based on the operational global data assimilation system at JMA. We have conducted OSSEs for DWL onboard a satellite in a polar and low-inclination orbiting satellite, showing forecast improvement by assimilating DWL with inflated observation errors. The preliminary results from the two measurement strategies will be presented.

Keywords: data assimilation, OSSE, Doppler wind lidar (DWL), global numerical weather prediction