

Observing System Simulation Experiments to evaluate the potential impact of alternative technologies
for space-based lidar winds on numerical weather prediction (Invited)

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Abstract

Observing System Simulation Experiments (OSSEs) are an important tool for evaluating the potential impact of proposed new observing systems, as well as for evaluating trade-offs in observing system design, and in developing and assessing improved methodology for assimilating new observations. Extensive OSSEs have been conducted at NASA/ GSFC and NOAA/AOML in collaboration with Simpson Weather Associates and operational data assimilation centers from 1985-2005. As described below, these OSSEs determined correctly the quantitative potential for several proposed satellite observing systems to improve weather analysis and prediction prior to their launch, evaluated trade-offs in orbits, coverage and accuracy for space-based wind lidars, and were used in the development of the methodology that led to the first beneficial impacts of satellite surface winds on numerical weather prediction. More recent OSSEs have continued to demonstrate potential for a space-based wind lidar to improve atmospheric analyses and forecasts, especially in the tropics. In this paper, we will report on new OSSEs designed to assess the potential impact of different lidar technologies.

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