

Analysis of simulated observations from a Doppler Wind Lidar

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Abstract

A simple two-dimensional analysis system has been developed at NASA's Data Assimilation Office for the purpose of exploring various configuration and data acquisition issues for a proposed future Doppler Wind Lidar instrument. The system has many of the characteristics of a full-scale analysis system for operational numerical weather prediction purposes, but on a reduced scale. Since the system is inexpensive to run, it therefore for the exploration of a wider range of issues than would be affordable in an Observation System Simulation Experiment (OSSE) context. Some of the issues studied so far are (i) the impact of single- vs dual perspective observations, (ii) the trade-off between observation accuracy and spatial coverage, and (iii) the impact of non-orthogonal dual perspective observations. These studies were aimed at assessing the overall information content of certain types of randomly distributed wind observations. In the next phase of exploration with this system, more realistic horizontal observation distributions are being studied in order to provide decision support for the technology development. In this presentation, we will show examples of the expected analysis impact in a number of different meteorological situations of a few of the possible satellite acquisition patterns.