

Using an airborne doppler wind lidar to explore the potential impact of a future space-based wind lidar, particularly in the case of “cloud challenging” tropical cyclones

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Abstract

An airborne Doppler wind lidar (DWL) was flown aboard a P3 aircraft during the THORPEX Pacific Asian Regional Campaign (TPARC – 2008) to investigate the lifecycle of tropical cyclones. While the primary role of the DWL on a P3 aircraft (P3DWL) was to obtain curtains of wind profiles to supplement dropsondes, a secondary objective was to collect and analyze the data to simulate the data density and perspectives of a future space-based DWL (SDWL). This aspect of the P3DWL operations also serves to “calibrate” the simulated DWL observations used in Observing System Simulation Experiments (OSSEs) being performed by NOAA and NASA in preparation for a future SDWL to meet the goals of the National Research Council's decadal survey. Examples from a study on the representativeness of several space-based DWL sampling patterns will be presented using the “oversampling” obtained with the airborne DWL as truth. The implications to data assimilation schemes and numerical weather prediction will be discussed.

14th Symposium on Integrated Observing and Assimilation Systems for the Atmosphere, Oceans, and Land Surface (IOAS-AOLS)AMS annual meeting, January 18, 2010, Atlanta, GA.