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LASE System Upgrade and Measurements From the NASA GRIP Field Experiment

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Abstract:

The Lidar Atmospheric Sensing Experiment (LASE) system has operated on the NASA ER-2, P-3, and DC-8 aircraft during the past 16 years and participated in 13 field experiments. This system provides vertical profiles of water vapor mixing ratio and aerosol and cloud backscattering. A brief overview is presented on the upgrade of LASE that included refurbishment of laser diode seeding, control and data system, and zenith receiver system. These developments have enhanced the operational reliability of the system and improved its performance. The LASE system was deployed on the NASA DC-8 aircraft recently for the NASA GRIP (Genesis and Rapid Intensification Processes) field experiment, which was conducted during August and September 2010 from operational bases in Fort Lauderdale, FL and St. Croix, VI. Initial measurements from this field experiment are presented including distributions of water vapor, aerosol, and clouds. Temperature profiles from DC-8 dropsondes and nearby radiosondes are used to derive relative humidity profiles from the LASE water vapor mixing ratio profiles. Comparisons of LASE water vapor mixing ratio profiles with those measured by the new AVAPS-II dropsondes from the NASA DC-8 are also presented.

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