



LASE measurements during NAMMA and GRIP field experiments

Syed Ismail, Richard Ferrare, and Jonathan Hair

NASA Langley Research Center, Science Directorate, Hampton, United States (syed.ismail-1@nasa.gov)

The Lidar Atmospheric Sensing Experiment (LASE) is an airborne DIAL system that provides high resolution measurements of water vapor and aerosol profiles and cloud distributions over the entire troposphere. Over the past 15 years, LASE has participated in 13 field experiments related to atmospheric science investigations ranging from the atmospheric boundary layer to the upper troposphere/lower stratosphere. This presentation describes LASE measurements acquired during the two most recent field missions. LASE participated in the NASA African Monsoon Multidisciplinary Analyses (NAMMA) field experiment in 2006 that was conducted from Sal, Cape Verde to study the Saharan Air Layer (SAL) and its influence on the African Easterly Waves (AEWs) and Tropical Cyclones (TCs). During NAMMA, LASE collected simultaneous water vapor and aerosol lidar measurements from 14 flights onboard the NASA DC-8. In this presentation we present examples of the interaction of the SAL and AEWs regarding: 1) moistening of the SAL and transfer of latent heat, 2) injection of dust in an updraft; and 3) influence of dry air intrusion on an AEW. The LASE system was also deployed on the NASA DC-8 aircraft during 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. We present examples of LASE measurements during GRIP that provided an opportunity to map the aerosol, cloud and water vapor environment over and in the vicinity of Tropical Storm Gaston and Hurricanes Earl and Karl. Measurements during GRIP over the Western Atlantic allows for a comparison of features of the SAL observed during NAMMA and GRIP missions.