

NASA LaRC -- Atmospheric Sciences Division (ASD)

Chemistry Dynamics Branch (CDB)

Lidar Applications Group Activities

The Lidar Applications Group (LAG) is part of the Atmospheric Sciences Center, Hampton, Virginia. Since 1978, the LAG has been developed a broad range of atmospheric investigations. These activities have included airborne Differential Absorption Lidar (DIAL) systems for studies. In 1980, the LAG made the first remote O₃ and aerosol profile measurements and this lidar system was subsequently used in a joint NASA/EPA study of pollution episodes. In 1981, they obtained the first water vapor profile with a DIAL system. This system was used in a Gulf Stream field experiment. Other studies of O₃ and aerosols have been conducted with the airborne DIAL system in the Global Tropospheric Experiments (GTE).

The first international field experiment was conducted over the tropics in 1982-1983, and the first cross section of a tropopause fold event was made in 1984 (GTE/CITE-1). Airborne lidar investigations of O₃ and aerosols were conducted over Barbados in 1984 (GTE/ABLE-1) and in Brazil over the Amazon in 1985 (GTE/ABLE-2A) and the wet season of 1987 (GTE/ABLE-2B). Lidar measurements were also made over tundra and ocean regions of the Arctic in 1988 (GTE/ABLE-3A); northern Canada in 1990 (GTE/ABLE-3B); the western Pacific in 1991 (GTE/ABLE-3C); and the western Pacific in 1994 (PEM-West B); and the tropical Atlantic from Brazil and the Caribbean in 1995 (GTE/ABLE-3D) and 1996 (GTE/ABLE-3E). Other experiments conducted as part of the GTE field experiments focused on the chemistry of the atmosphere in various tropospheric environments. The LAG has also participated in the Arctic Ozone Experiment (AAOE) in 1987; the Airborne Arctic Stratospheric Experiment (AASE-II); and the Tropical & Vortex Ozone Transport Experiment

An airborne DIAL system was developed in 1989 using an alexan in the middle to lower troposphere. This system was flight tested 1990-1992 and again in 1994, and accurate water vapor profile measurements from an ER-2 aircraft was conducted in 1994, and completed in an extensive validation experiment conducted in 199

The Lidar Applications Group also participated in the development which is an aerosol and cloud lidar system that flew on the Shuttle made with several airborne lidar systems, and data were analyzed. In addition, studies are being conducted of various advanced space

These Lidar Applications Group activities have led to many journal

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