

LACE and PANTHER GC-ECD and GC-MSD Airborne Instruments

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We report on two successful deployments accomplished by CMDL scientists this year. In September, we conducted an Observations of the Middle Stratosphere (OMS) balloon flight out of Fort Sumner, New Mexico, that acquired Lightweight Airborne Chromatograph Experiment (LACE) data from the free troposphere up to 32 km in the midlatitudes. This data set contains measurements of age of air, total chlorine and bromine, nitrous oxide (N₂O), methane (CH₄), and H₂. In January we participated in the NASA SAGE (Stratospheric Aerosol and Gas Experiment) III Ozone Loss and Validation Experiment (SOLVE) II campaign with deployments out of NASA Dryden Flight Research Center at Edwards Air Force Base and Kiruna, Sweden. During SOLVE II, the PAN and other Trace Hydrohalocarbons Experiment (PANTHER; Figure 1) instrument along with 13 other instruments on board the DC-8 aircraft, sampled air from the midlatitudes across the vortex edge and into the vortex core region. In January, the northern vortex broke into two lobes that then rejoined, thereby trapping midlatitude filament structures inside the vortex. These interesting vortex dynamics and the subsequent mixing, coupled with the production of numerous polar stratospheric clouds (PSCs), made for a highly successful mission, including something for the in situ instruments and the remote lidar and solar-tracking instruments. The SAGE III satellite was finally operational, so a major goal of calibration and validation was achieved.

During these deployments, LACE, a three-channel gas chromatograph-electron capture detector (GC-ECD), performed well and PANTHER, a four-channel GC-ECD and a two-channel gas chromatograph-mass selective detector (GC-MSD) with cryo-trapping, operated at 80% of full capacity. These two instruments are on display for viewing along with a poster that outlines their capabilities and shows some representative data to highlight the quality of the measurements.

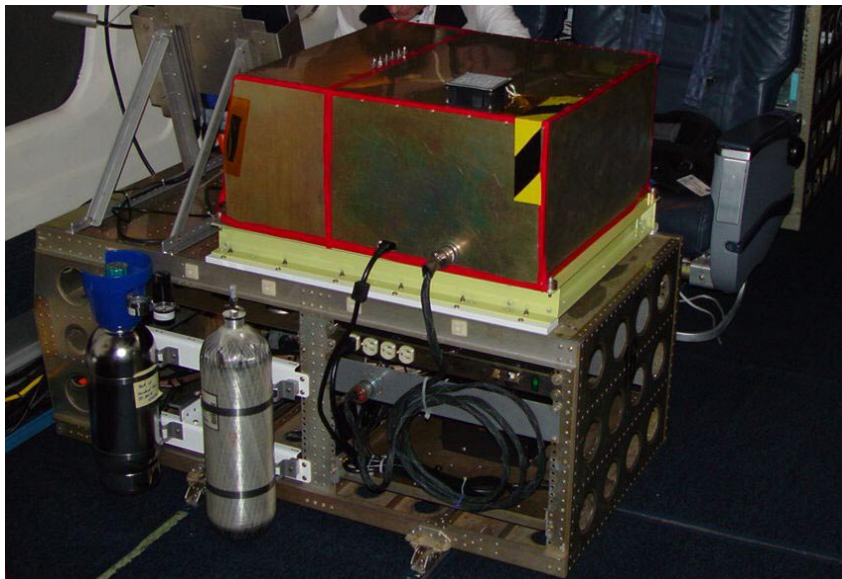


Figure 1. PANTHER instrument onboard the DC-8 aircraft.