

Chlorine Chemistry of the Lower Stratosphere: Aircraft (ALIAS, ER-2) and Balloon (111,ISS) in-Situ Measurements of HCl, NO₂, and N₂O for Testing Heterogeneous Chemistry

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Stratospheric concentrations of HCl measured in the northern hemisphere from the ER-2 aircraft are significantly lower than model predictions using both gas phase and heterogeneous chemistry, but measurements in the southern hemisphere are in much better agreement. The latitudinal and seasonal differences in HCl/Cl_y will be described using data from 65°N to 65°S from the 1994 ASHOE/MAESA campaign.

In-situ measurements of HCl from the Aircraft Laser Infrared Absorption Spectrometer (ALIAS) on the ER-2 and the Balloon-borne Laser in-situ Sensor (BLISS) will be presented and intercompared with satellite (UARS), shuttle (ATMOS), and balloon (MARK IV) data sets. In conjunction with other in-situ measurements from the ER-2, details of the observed HCl losses from PSC chemistry during the ASHOE/MAESA southern hemisphere campaign of 1994 will be described with respect to the stoichiometry of the heterogeneous reactions responsible for the observed HCl losses and ClO production. The 1991 southern hemisphere results will be compared with those from the 1991/2 northern hemisphere.

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