

BNL-63546

Intercomparison of peroxide data from the DOE G-1 and NOAA P-3 aircraft during the 1995 Nashville SOS Study

J. B. Weinstein-Lloyd, J. H. Lee, P. H. Daum, B. T. Jobson, and D. D. Parrish

American Geophysical Union 1996 Fall Meeting, San Francisco, CA, Dec. 15-19, 1996.

Peroxide measurements were obtained during wingtip-to-wingtip flights near Nashville, TN, on June 29, July 6, and July 13, 1995. A dual-channel pOHPAA/catalase instrument was deployed on the P-3 and a three-channel Fenton/pOHPAA system was used on the G-1. These instruments employ different inlet systems, geometries and flow rates, and fundamentally different chemistries to assess what percentage of the total is contributed by organic peroxide. Total peroxide concentrations between 2 and 10 ppbv were observed. Comparison of the pOHPAA channels, after correction for differences in response time, shows remarkably close agreement for most of the flight data. Agreement is poor for H_2O_2 and ROOH concentrations extracted from differences between channels, with the Fenton/pOHPAA system showing generally higher concentrations of ROOH and lower concentrations of H_2O_2 than the pOHPAA/catalase instrument. When experimental uncertainties, e.g., flow rate and temperature effects, are considered the observed differences lie outside experimental error, but the results agree well enough that mathematical modelling is unlikely to identify one or the other measurement as correct. These results highlight the need for a formal intercomparison of techniques for the analysis of H_2O_2 and individual organic peroxides.