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AIRBORNE CARBONYL COMPOUND MEASUREMENT DURING THE 1995
NASHVILLE INTENSIVE

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Using a glass-coil/DNPH/HPLC technique we measured formaldehyde (FA) on the NOAA WP3 aircraft, and glycolaldehyde (GA), glyoxal (GL) and methylglyoxal (MG), as well as FA, on the DOE G1. [FA] determined on the two aircraft during 3 intercomparison flights agreed well. The maximum and median [FA] determined on the WP3 ($n = 1380$) and the G1 ($n = 650$), i.e., 12.0 and 3.4 ppbv, and 13.4 and 3.2 ppbv, respectively, were nearly identical, despite a greater spatial coverage of the WP3 over the G1. The daily FA maximum observed increased from ~ 5 ppbv (6/24-7/7) to ~ 12 ppbv (7/14-7/16, a stagnation period), corresponding well with a similar ozone trend in the same period. A morning flight on 7/3, a calm period, showed FA levels to be unchanged from values of previous afternoon, indicating weak or no nighttime sink for this compound and the importance of this compound as a radical source in morning hours. The maximum and median concentrations of GA, GL, and MG (all in ppbv) were, respectively, 2.5 and 0.56, 0.3 and 0.05, and 0.9 and 0.08. Exhibiting strong correlations ($r \geq 0.9$), the ratios of GA/FA (0.23), MG/FA (0.06), and MG/GL (3.3) were consistent with that expected from isoprene oxidation. Although isoprene alone can give rise to the observed FA levels in forested regions, additional precursors appear to be important in farmland regions where isoprene levels are low.