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## OZONE PRODUCTION DURING AN URBAN AIR STAGNATION EPISODE OVER NASHVILLE, TN

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The highest O<sub>3</sub> levels observed during the 1995 Southern Oxidants Study in middle Tennessee occurred during a period of air stagnation from July 11 through July 15. Extensive airborne (two fixed wind and one helicopter) and ground-based measurements of the chemistry and meteorology of this episode near Nashville, TN are presented. In situ airborne measurements include O<sub>3</sub>, NO<sub>y</sub>, NO, NO<sub>2</sub>, SO<sub>2</sub>, CO, nitrate, hydrocarbons, and aldehydes. Airborne LIDAR O<sub>3</sub> measurements are also utilized to map the vertical and horizontal extent of the urban plume. Interactions with the Gallatin power plant plume are also shown.

Under these worst case meteorological conditions, ambient O<sub>3</sub> levels approaching the NAAQS were observed in Nashville even in the absence of high background levels. For example, on July 12, the background was 60 to 70 ppb O<sub>3</sub> while the urban plume maximum had over 140 ppb O<sub>3</sub>. Airborne mapping and LIDAR data clearly illustrate that high O<sub>3</sub> levels can occur during stagnation episodes within a few kilometers of and even within the urban center. The small spatial scale of the zone of high O<sub>3</sub> concentrations in this episode demonstrates that regulatory monitoring networks may fail to document the maximum O<sub>3</sub> concentrations. Modelers using such regulatory data to test photochemical algorithms need to bear in mind that urban maxima may be underestimated by the monitoring network, especially in medium sized urban areas under slow transport conditions. Finally, this effort shows the value of collaborative field measurements from multiple platforms in developing a more complete picture of the chemistry and transport of photochemical O<sub>3</sub>.