

## Surface ozone and its precursor gases at Allahabad (25°28'N latitude and 81° 52'E longitude) a tropical urban site in India

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Surface measurements of ozone and its precursor gases (NO<sub>x</sub> and CO) have been made over an urban site Allahabad (25° 28'N latitude and 81° 52'E longitude) in tropical India. The daytime ozone production is basically due to the photooxidation of the precursor gases. Boundary layer processes and meteorology also play an important role in its variabilities. Diurnal variation in  $NO_x$  and CO are a manifestation of combined effects of local emission, boundary layer processes chemistry and local wind pattern. The concentration of zone during the period increased from a minimum value of 14 ppbv around 7.00 a.m., to a value of 35 ppbv. The minimum concentration of surface ozone is 14–15 ppbv, which rose to a maximum values of 34 - 35 ppbv during the study. Fog condition is prevailing during 19<sup>th</sup> – 26<sup>th</sup> of December 2004 along with vary hazy atmosphere. The day average ozone concentration during the fog condition has been found to be low (14 ppbv) compared to pre fog (32 ppbv) and post fog (35 ppbv) conditions. A sudden drop of ozone concentration during the fog period is mainly due to scavenging process and dilution of polluted air. Rates of changes of ozone during the hours of 1400 to 1800 are higher at Allhabad is similar to the observations of urban sites (Ahmedabad and Delhi reported by Naja and Lal (2002). The lowest values (350 -380 ppbv) of CO concentrations are observed during 0900 -1700 hrs during the campaign period. The maximum concentration of (2500 ppbv) CO is observed during late evening hours (1900 - 2200 hrs). It is due to the large number of vehicles transport and also pollutants get trapped in the shadow surface layer and show higher layer. The lowest values both for the species  $NO_x$  and CO are 8-10 ppbv and 350–380 ppbv respectively during 0400-0800 hrs for the campaign period. Higher levels of  $NO_x$ and CO during late evening hours at Allahabad are due to the combination of anthropogenic emissions, boundary layer processes, chemistry as well as local surface wind patterns. Diurnal variations of NO<sub>x</sub>, O<sub>3</sub> and CO values are low during fog period and compared to pre-fog and post-fog period.

Keywords: Carbon monoxide; nitrogen oxides; surface ozone.

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