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Assessment of Black Carbon Aerosols and Trace Gases over Urban Atmosphere

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Mega cities are very important sources of aerosols and trace gases, which can be important in determining the radiative balance of the atmosphere on urban, regional and global scales. Several studies on aerosol effects in radiative balance have been focused on sulfate aerosols whereas carbonaceous aerosols are beginning to gain attention because of their importance in the global radiative balance. In the present study concurrent measurements of BC, CO,O_3 and SO_2 have been carried over urban areas of Hyderabad, India to understand the diurnal variations and anthropogenic influences. Diurnal variations of CO and SO_2 suggest a distinct forenoon peak and a less distinct second peak over the study area. The surface ozone concentration varies from 30ppbv to 66ppbv starts increasing gradually after sunrise attaining a maximum value by the noontime and decrease gradually thereafter. Diurnal variations of BC concentrations (1-60 µg/m^3) showed high concentrations during morning and evening hours correlating with the traffic density patterns over the study area. Black carbon aerosols showed negative correlation with tropospheric ozone suggesting scavenging of Ozone due to adsorption by BC aerosols. BC showed positive correlation with CO and SO_2 and the results have been discussed in the paper.

Keywords: Black Carbon; Sulfur dioxide, Tropospheric Ozone; Carbon monoxide