1.099 Biomass Burning Contribution of Carbonaceous Aerosols at Suburban and Rural Sites in Indo-Gangetic Plain.

Early Career Scientist

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Abstract:

For the past few decades, seasonal appearance of a thick blanket of aerosol particles all over North India from Southern edge of the Himalayas to the Bay of Bengal has been attributed to various anthropogenic emissions. Studies have revealed that unique topography of North India and meteorological conditions during winters further lead to the accumulation of pollutants in the lower atmosphere. Indo-Gangetic Plain (IGP) is among one of the most densely populated regions around the world, where 70% population is still residing in the villages. Growing energy demands have led to the increased pollutant emission from industrial and transport sectors. Biomass such as woods, dung cake, dry leaves and crop residues used for traditional cooking and heating purposes and open field burning in rural areas have further added to the aerosol loadings in the atmosphere over the IGP. The present work is an attempt to characterize the carbonaceous aerosols (Organic Carbon and Elemental Carbon) in the fine mode (<2.5µ) particles. Sampling was conducted during winter months (November 2016 to February 2017) at a suburban and a rural site in IGP. Simultaneous analysis of major inorganic ions (Na^+, NH_4^+, K^+, Ca^{2+}, Mg^{2+}, Cl^-, NO_2^-, NO_3^- and SO_4^{2-}) was also carried using re-fluxing mist chamber to find out the possible sources. OC and EC levels were found to be strikingly higher at the rural site (71.3 and 47.6 µg/m^3, respectively) as compared to the suburban site (30.1 and 23.5 µg/m^3, respectively). Correlation and factor analysis of data suggested that biomass burning for cooking, crop residues burning and emission from agriculture activities as significant sources at the rural site. However, vehicular exhausts, waste burning, construction activities and re-suspended dust were found to be primary contributing sources at the suburban site. Their dynamics in detail will be discussed in the conference.