The Physical and Chemical Interactions Between the Southwest Monsoon Rains and Aerosols Over the Indo-Gangetic Basin

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The southwest Asian summer monsoon not only provides water and food security over the Indo-Gangetic Basin, it also plays an important role in reducing atmospheric pollution. In order to quantify the effect of monsoon withdrawal on aerosol loading, airborne particles were collected during the waning phase of the monsoon. Airborne particles (PM_{10} size fraction) were collected between July and October 2015 at Kanpur, which is a large industrial city in the central part of the Indo-Gangetic Basin. The study shows that withdrawal of the southwest monsoon since July 2015 increased the aerosol loading in the ambient air by up to 28, 43 and 152% during August, September, and October respectively. The aerosol loading exceeded the ambient Indian National Air Quality Standard (NAAQS) limit of 100μg/m^3 within three months of the waning phase of the monsoon. The study further shows that monsoon withdrawal increased the concentration of heavy metals (Cr, Ni, Cu and Cd) in the atmosphere. The only heavy metal that did not show an increasing trend was Pb, which indicates that Pb is either coming from local source(s) or that Pb was not efficiently scavenged by wet deposition processes. In general, Cd, Pb, and Cu concentrations were 10-1500 times higher when compared to upper continental crust and were mostly derived from coal burning products[1].

[1]Nizam, S. and Sen, I. S**.,** 2016. Effect of Southwest Monsoon Withdrawal on Airborne Particles Over the Indo-Gangetic Basin: Aerosol Loading and Heavy Metal Concentrations. Atmospheric Environment *(submitted)*