

Seasonal variability of aerosol properties and their impact on radiative forcing during 2010 over Greater Noida - Northern India

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The aerosol optical properties show strong seasonal variations over northern parts of India including the Indo-Gangetic Plains during summer and winter seasons. While the winter season is characterized by thick haze as a result of anthropogenic emissions, the summer season (pre-monsoon period) is dominated by enhanced dust transport. We present over 1-year of analysis of satellite and ground observations of aerosol optical properties and surface solar radiation flux measurements over the Greater Noida region (28-28°N, 77-29°E) in northern India, which is located 50 km west of Delhi at a downwind site. Our measurement site is located in close proximity to a major coal-fired thermal power plant thus affecting the aerosol properties depending on the prevailing wind pattern. The aerosol loading is found to peak in the pre-monsoon season with large influence of coarse particles while fine-mode pollution prevails during the winter period. We will also present results related to the regional aerosol shortwave radiative forcing obtained from co-located pyranometer and handheld sunphotometer measurements. Aerosol radiative forcing and solar absorption estimates are also carried out and compared during the contrasting winter and summer season. Aerosol characteristics and radiative forcing estimates from this study are also compared with estimates available over other regions in the Indo-Gangetic Plains. The results of this study are anticipated to better understand the aerosol characteristics in complex environment and to enhance the overall knowledge of regional radiative forcing in northern India.