2.157 Variability of Particulate Matter Concentrations During Dense Haze Period in Northeastern Pakistan.

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Abstract:

Persistent fog during winter has become a severe problem across the borders of South Asia in socio-economic context. It has caused severe health and visibility problems resulting in huge number of casualties and economic loss. Atmospheric pollutants, especially fine aerosol particles are responsible for the formation of intense fog. These aerosol particles result from combustion processes in vehicle, domestic and during industrial activities. Recently, the number of sources has increased thus contributing more towards increasing intensity and toxicity caused by the foggy conditions. Especially, the energy crisis across the South Asian countries has resulted in use of a mix of fossil fuels (biofuel, solid waste, coal, natural gas) with several question marks on their quality and renewability to deal with energy demands. The increased emissions of fine particles have provided more condensation nuclei. PM10 and PM2.5 samples were collected at Lahore and Faisalabad sites during the winter 2015 /16 and 2016 / 17. At Faisalabad day time PM10 concentrations were found to be ranged from 200 - 600 µg m–3 while PM2.5 were 100 - 300 µg m–3 while night time concentration of 790 µg m–3 were observed for PM10. While at Lahore due to high moisture contects night time concentrations of PM10 were ranged from 500 µg m–3 to 2500 µg m–3. Correlation with ground based satellite AOD were also observed. Beside boundary layer / mixing height were studied during the study period, it was found that inversion layer at pressure level of 800 mb were formed during dense haze days and elevated concentration of particulate matter were found that shows the accomulation of pollution by mixing layer height.
Key words: particulate matter, inversion layer, haze, winter fog, aerosols