

# **Measurements of Particulates (PM<sub>10</sub> and PM<sub>2.5</sub>) Concentration over Darjeeling (27.01 N, 88.25 E, 7204 Feet), India - a site in Eastern Himalayas**

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Increasing trend of air pollution and their adverse health effect is a matter of great concern these days. To understand the air quality of a particular place it is very important to determine the concentration of the criteria air pollutants. In this view regular measurements of PM<sub>10</sub> and PM<sub>2.5</sub> have been started at Bose Institute, National Facility on Astroparticle Physics and Space Sciences campus, Darjeeling since 2004 for long-term objectives. For this work, however, the data since September 2004 to February 2006 have been used.

The coarser fractions PM<sub>10</sub> and the finer fraction PM<sub>2.5</sub> were monitored respectively using the Respirable Dust Sampler (RDS, Model APM – 460 BL, Envirotech) and fine particulate sampler (FDS, Model APM 550, Envirotech). The specific airflow rates for particulate sampling using RDS and FDS were maintained in accordance to that given for the mechanism in the respective manuals. PM<sub>10</sub> fraction was retained in the EPM 2000 GF/A Whatman filter paper while fine fraction was retained in the Teflon filter paper. Concentrations were determined gravimetrically following standard procedure. All necessary precautionary measures (preconditioning of the filter paper, proper desiccation, etc) were adopted to avoid any error in measurements and also any ambiguity that might arise in the subsequent data interpretation.

On an average, the mass concentration of PM<sub>10</sub> and PM<sub>2.5</sub> were found to be  $44.32 \pm 35.14 \mu\text{gm}^{-3}$  and  $33.93 \pm 25.1 \mu\text{gm}^{-3}$  respectively for the period September 2004 to February 2006. However, the annual mean for 2005 January to December was  $40.31 \pm 32.67 \mu\text{gm}^{-3}$  and  $24.19 \pm 15.53 \mu\text{gm}^{-3}$ . The monthly average mass concentration of PM<sub>10</sub> and PM<sub>2.5</sub> was found to vary between  $8.61 \mu\text{gm}^{-3}$  and  $8.56 \mu\text{gm}^{-3}$ , respectively, in August to  $101.15 \mu\text{gm}^{-3}$  and  $41.94 \mu\text{gm}^{-3}$  in April. The ground-based observations are analyzed in connection to aerosol optical depth as obtained from satellite measurements.