Temporal Analysis of Atmospheric Black Carbon over a Coastal Station in Goa

H. B MENON[1], S. SHILPA[1] AND K. KRISHNAMOORTHY [2]

[1] *Department of Marine Science, Goa University, University P.O, Pin: 403206, Goa, India.*
[2] *Space Physics Laboratory, VSSC, Thiruvananthapuram, Kerala.*

Time series measurements of black carbon (BC) were carried out from a coastal station in Goa for a period of two years (from January 2008 to December 2009). The data were used to characterize BC, for the first time, over Goa, an area subject to the effect of aerosol generated both due to natural process and anthropogenic activities. From the diurnal variation of BC, it is observed that highest concentration is encountered during the early hours of the day and lowest in the afternoon. Monthly variation of BC during 2008 showed a significant decrease from January (~3750 ng/m3) to June (~300 ng/m3) and a subsequent increase from July (~500ng/m^3) to December (~6500 ng/m3). Though a similar pattern is seen in the monthly variation of BC during 2009, an inter-annual variation is vivid. A comparison of BC during the pre-monsoon period (January to May) of 2008 and 2009 revealed that BC is lower (2500ng/m^3) during 2008 than in 2009 (3200ng/m^3).But the case is different during the post -monsoon period (October to December). BC is more during the post-monsoon period of 2008(4642ng/m^3) than during the same period of 2009 (3185ng/m^3). Atmospheric boundary layer dynamics along with meteorological factors have been analyzed to understand the BC dynamics over the study region. In addition to this, to understand the contribution of long range transport, HYSPLIT (Hybrid Single Particle Lagrangian Integrated Trajectory Model) analysis has been carried out and percentage contribution from each source has been calculated.

Keyword: Black Carbon; Aethalometer; Diurnal variation; Seasonal variation