

Aerosol Microphysics and Source Characteristics over Port Blair

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Long term synthesis of spectral aerosol optical depth (AOD) at an island location, Port Blair (11.63 °N, 92.7 °E, PBR) in the Bay of Bengal revealed that the spectral curvature (spectral dependence of AOD in log-log scale) fluctuates rapidly between concavity and convexity even within a season/month. This large variability in microphysical properties of aerosols is associated with the changes in the prevailing air mass. The Concentration Weighted Trajectory (CWT) analysis during the winter and premonsoon season revealed that the highest potential source for aerosol loading at the island is the northern east Asia when the spectral curvature was convex (when the derivative of the Angstrom exponent, α' is positive), whereas when the spectral curvature was concave, the potential source of advection is the Indian subcontinent. In short, the advected aerosols from the Indian subcontinent restrain natural aerosol dominance and from the East Asian region keeps anthropogenic aerosol dominance at the receptor site.

Keywords: Aerosol Optical Depth, Angstrom exponent, Concentration Weighted Trajectory Analysis