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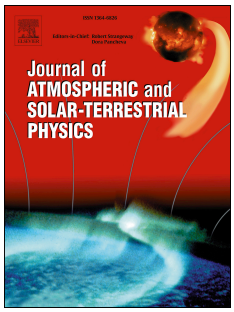

The role of Boundary Layer Height (BLH) variations on pollution dispersion over a coastal station in the Southwest Peninsular India

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The role of Boundary Layer Height (BLH) variations on pollution dispersion over a coastal station in the Southwest peninsular India

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We report the variability of Boundary Layer Height (BLH) and Ventilation Coefficient (VC) over a coastal station in southwest Peninsular India from vertical soundings. Altitude profile of Virtual Potential Temperature (θ_v) (derived from balloon-borne GPS radiosonde observations) was used to study the seasonal changes of BLH over Thumba (8.5°N, 77°E), a coastal station in southwest Peninsular India. Variability in the BLH is maximum during the pre-monsoon season and minimum during the winter, whereas the VC was found to be highest in the summer and lowest during winter. It is revealing the excellent efficiency in the dispersion of pollutants during the summer monsoon season. Conversely, low VC during winter and post-monsoon seasons showed great potential for pollution at this site. Role of VC on the dispersion of pollution was also examined using surface mass concentration of Black and Organic Carbon (BC and OC), sulphate and columnar Aerosol Optical Depth (AOD). High value of VC lowers the surface mass concentrations of BC, OC and sulphate during winter and maximises during summer monsoon and decreases the pollution potential.

Key words: Boundary Layer height, Aerosols, ventilation coefficient

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