

The influence of synoptic factors on variations of atmospheric aerosol optical depth under Siberian conditions

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Abstract

© 2011, Pleiades Publishing, Ltd. Based on multiyear measurements of the atmospheric aerosol optical depth (AOD) in a typical region of Siberia (Tomsk), we analyzed the relationship between the AOD and different synoptic factors. The averaged spectral AOD dependencies for two air mass types (continental polar and Arctic air) and different pressure systems are compared. The effect of cloud cover and precipitation on the AOD is estimated. We discuss the results of wavelet analysis of the time series of the AOD and columnar water vapor for a number of observation sites (AERONET stations in Tomsk, Yekaterinburg, Irkutsk, Yakutsk, and Ussuriisk). The specific features of synoptic-scale quasi-periodic variations at different measurement sites are identified and compared.

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