



Joint use of ground-based measurements and MODIS data for estimating the direct aerosol radiative effect under conditions of elevated atmospheric turbidity in two regions of Asian part of Russia

Tatiana B. Zhuravleva, Sergey Yu. Andreev, Tatiana B. Bedareva, Dmitry M. Kabanov, Ilmir M. Nasrtdinov, and Sergey M. Sakerin

V.E. Zuev Institute of Atmospheric Optics SB RAS, 1, Academician Zuev square, Tomsk, 634021, Russia

The climate effect of aerosol has significant regional and seasonal differences. Among the natural factors, the maximum aerosol impact (except that due to volcanic eruptions) on the atmospheric radiative characteristics is manifested in situations of the smokes from forest fires, as well as under impact of dust and anthropogenic emissions. The main characteristics, determining the direct radiative effect of aerosol, are the aerosol optical depth (AOD) of the atmosphere, single scattering albedo, and surface albedo.

In this work, we consider the aerosol characteristics in two different regions of boreal zone of Asia: in West Siberia and Primorye. The main source of high turbidities in the Siberian region is the smoke aerosol; and for Primorye (in addition to smokes) characteristic are arid outbreaks from Mongolia and northeastern China deserts. The variety of aerosol types and seasonal variations of the sources and circulations complicate the interpretation of results of expedition studies. Therefore, important means in support of time- and space-limited experiments are multiyear data of ground-based and satellite aerosol measurements.

We described the specific features of the spatial distribution of the annual behaviors of AOD and moisture content of the atmosphere according to data of multiyear (2004-2010) ground-based (AERONET) and satellite (MODIS) observations. For these territories, we presented the estimates of the aerosol radiative effect in the periods of maximum aerosol turbidities (spring and summer).

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