Significant uncertainty of different climatic estimates is caused by insufficient taking into account the role of atmospheric aerosol in absorption and scattering of visible radiation. One of the main absorbing constituents is soot (BC). To estimate the radiative effect and the respective influence of soot on the climatic system, it is necessary to know the single scattering albedo.

This paper generalizes the results of long-term observations of the scattering coefficient of submicron aerosol and the concentration of soot obtained at the V.E. Zuev Institute of Atmospheric Optics SB RAS in Siberia. Measurements of the angular scattering characteristics were carried out by means of a nephelometer, and mass concentration BC was measured by an aethalometer.

The results of every-hour round-the-clock measurements in the near-ground layer (Tomsk; 56°N, 85°E) are analyzed. The single scattering albedo is estimated using empirical optical model of the atmosphere of West Siberia based on data of airborne measurements carried out in 1986-1988, and its modification added by the data array of airborne sensing of the aerosol scattering coefficient and the mass concentration of soot carried out in 1997-2009.

The obtained results are compared with the data of 5 flights over north-east regions of Russia (66–72°N, 66–170°E) carried out in 2008 and 2010, as well as with the data obtained over seas adjacent to the territory of Russia (White and Kara Seas, 2003-2007; Japan and Okhotsk Seas, 2009-2010).

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