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Brown carbon in winter smogs of Beijing city

Oleg I. Datsenko[1] , Gennady I. Gorchakov[1] , Alexey V. Karpov[1] , Roman A. Gushchin[1]

[1] A.M. Obukhov Institute of Atmospheric Physics, Russian Academy of Sciences

datsenko@ifaran.ru

The processes of shortwave solar radiation transport in anthropogenically caused smogs are influenced by black carbon absorption. It was shown in [1] that a noticeable contribution to the absorption of radiation by smogs can also be made by “brown carbon” (BrC), which are organic compounds with a broad absorption band in the ultraviolet region of the spectrum. In [2], a new non-photochemical mechanism of winter smog formation was described, which was brought to the attention of researchers in January 2013.

In this connection, a new task arose to investigate the variability of optical and microphysical characteristics of aerosol in non-photochemical smogs, variations of black carbon and brown carbon content in winter smogs of Beijing.

In this paper, the variability of particle size distribution function, aerosol optical attenuation thickness, imaginary part of refractive index and single scattering albedo in winter smogs of Beijing city were analyzed. The statistical characteristics of variations of aerosol optical characteristics in winter smogs of Beijing were calculated. Statistical relations of brown and black carbon content with aerosol optical thickness were studied.

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