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METHOD AND COMPUTATIONAL ALGORITHMS FOR ATMOSPHERIC CORRECTION OF
REGIONAL SATELLITE IMAGES. RESTORATION OF THE SPECTRAL BRIGHTNESS OF THE
EARTH'S SURFACE

Abstract

The method under consideration belongs to the field of space methods for studying the Earth's surface and can be used in assessing the characteristics of the state of aerosol layers in the lower atmosphere and the Earth's surface according to regional multichannel satellite images. Essence: according to the data of long-term measurements of the brightness of the daytime sky, statistically homogeneous and isotropic regions of the surface air layer are identified. Based on long-term measurements of the optical thickness of the atmosphere, an optical model of the atmosphere is given, consisting of an average and a statistical model of its aerosol layers. The method provides algorithms and computational programs for atmospheric correction of space images in relation to the conditions of the Caucasus-Caspian region. For a pixel of a dark object of a regional space image with a minimum brightness (water surface, vegetation), average profiles and deviations from the average optical thickness of aerosol layers are calculated. The distributions of the spectral brightness coefficient (SBC) of the atmosphere and underlying surface are calculated, and the inverse problem of atmospheric optics is solved in order to restore the microstructural parameters of aerosol layers. Atmospherically corrected values of the underlying surface SBC for statistically homogeneous and isotropic areas of the surface air layer are used to calculate the vegetation index of the land cover.