Atmospheric correction of satellite images of the Earth's surface with allowance for radiation polarization

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Nowadays, satellite remote sensing data, which require fast and high-quality atmospheric correction, are widely used. To monitor the state of the surface of the Earth (albedo), data on the reflection coefficient of the Earth's surface is necessary. When restoring this reflection coefficient of the Earth's surface, a number of difficulties arise, and therefore it is necessary to solve a complex inverse problem. The polarization of light is usually neglected in the problems of atmospheric correction. However, our studies have shown that there are optical–geometrical conditions [1] when the neglect of the influence of polarization leads to errors that can exceed the value of the restored reflection coefficient.

We propose an algorithm for retrieving the reflection coefficient of the Earth's surface that takes into account the polarization of radiation and yields greater accuracy than the standard MOD09 NASA algorithm. The corresponding software package has been tested on real satellite images of the MODIS instrument, and the results have been compared with ground-based measurements and the MOD09 NASA algorithm. The comparison results are presented in the talk.

Reference

[1] Zimovaya, A.V., M.V. Tarasenkov, V.V. Belov, 2018: Radiation polarization effect on the retrieval of the Earth's surface reflection coefficient from satellite data in the visible wavelength range. *Atmos. Oceanic Opt.* **31**, 131–136.

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