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Satellite monitoring of the Earth's radiation balance and mapping the distribution of its components

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A new «Meteor» satellite program has been started in Russia. The first satellite of new generation «Meteor-M» №1 was put into orbit on September 16, 2009. The equipment IKOR – «The Measuring instrument of short-wave reflected radiation» was created in Saratov State University. It was installed on Russian hydrometeorological satellite «Meteor-M» №1. Radiometer IKOR is intended for satellite monitoring of the outgoing reflected short-wave radiation, which is one of the components of Earth radiation balance. Such information can be used in different models of long-term weather forecasts, in researches of climate change trends and also in calculation of absorbed solar radiation values (ASR) and albedo of the Earth-atmosphere system. It was assessed spatial and temporal variations of albedo and the absorbed solar radiation over different regions. Latitudinal distributions of albedo and ASR were estimated in more detail. Meridional cross sections over oceans and land were used separately for this estimation. It was shown that the albedo and ASR data received from the radiometer IKOR can be used to detect El-Nino in the Pacific Ocean and monitoring of the East Asian Summer Monsoon. It should be noted that cloudiness makes a significant contribution to the planetary albedo of the Earth, largely determines its spatial-temporal distribution. In particular, it is important to know what contribution cloudiness makes to albedo and what the relationship between them. Therefore, comparisons between albedo and cloudiness were conducted separately for land and oceans. The comparison of the distributions of cloudiness and albedo had identified the existence of significant correlation to the World Ocean, lower values for the World Ocean and land together and small correlation for land. The report will be presented more detailed results.

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