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Variability of Earth's radiation budget components during 2009 - 2015 from radiometer IKOR-M data

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This report describes a new «Meteor-M» satellite program which has been started in Russia. The first satellite of new generation "Meteor-M» № 1 was put into orbit in September, 2009. The radiometer IKOR-M – «The Measuring instrument of short-wave reflected radiation" was created in Saratov State University. It was installed on Russian hydrometeorological satellites «Meteor-M» № 1 and № 2. Radiometer IKOR-M designed for satellite monitoring of the outgoing reflected short-wave radiation, which is one of the components of Earth's radiation budget. 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 and albedo of the Earth-atmosphere system.
Satellite «Meteor-M» № 1 and № 2 are heliosynchronous that allows observing from North to South Poles. The basic products of data processing are given in the form of global maps of distribution outgoing short-wave radiation (OSR), albedo and absorbed solar radiation (ASR). Such maps were made for each month during observation period. The IKOR-M product archive is available online at all times. A searchable catalogue of data products is continually updated and users may search and download data products via the Earth radiation balance components research laboratory website (http://www.sgu.ru/structure/geographic/metclim/balans) as soon as they become available.
Two series of measurements from two different IKOR-M are available. The first radiometer had worked from October, 2009 to August, 2014 and second - from August, 2014 to the present. Therefore, there is a period when both radiometers work at the same time. Top-of-atmosphere fluxes deduced from the «Meteor-M» № 1 measurements in August, 2014 show very good agreement with the fluxes determined from «Meteor-M» № 2.
The seasonal and interannual variations of OSR, albedo and ASR were discussed. The variations between SW radiation budget components seem to be within observational uncertainty and natural variability governed by cloudiness, water vapor and aerosol variations.
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-M can be used to detect El Nino in the Pacific Ocean and monitoring of the East Asian Summer Monsoon.
The report will be presented more detailed results.
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