

**The results of the condition and operation of automated meteorological and solar radiation networks in 2014.** Gavrilova S. Yu., Ivanova T. A., Lutsko L. V., Miasnikova O. A. Proceedings of MGO. 2015. V. 577. P. 7-33.

The results of monitoring the condition and operability of automated meteorological and solar radiation complexes, and automatic meteorological stations installed by the Roshydromet Project-1 for 2014. The technical condition of the automated measuring instruments, metrology and software are analyzed. The main problems in the operation of the equipment AMC, AMC, and AAC are pointed. The recommendations to ensure the stable operation of the automated meteorological and solar radiation networks are made.

*Keywords:* monitoring, metrology, automated meteorological complex, automated solar radiation complex, automatic meteorological station

Tab. 3. Fig. 12.

**Ways and problems of climatic division into districts of the territory of the Russian Federation.** Kondratyuk V. J., Svetlova T. P., Ivanova K. M. Proceeding GGO. 2015. V. 577. P. 34-46.

Features of allocation of uniform areas in the meteorological relation in their communication with heterogeneity of the spreading surface for the solution of problems of climatic division into districts of territories of various spatial extent and an objektivization of carrying out borders of the allocated areas are considered.

A method for climatic regionnig UGMS, based on the multivariate statistical analysis of generalized over many years characterized heat-moisture and precipitation on all operational and functioning UGMS stations was developed.

Allocation of climatic areas of territories 23 UGMS Roshydromet is executed. Schemes of climatic division into districts of territories of UGMS and the corresponding Recommendations about their use are submitted in all UGMS for their practical application as a basis at any solution of the tasks assigned to UGMS.

The limit of possible reduction of points of climatic supervision which providing the main hydrometeorological information consumers becomes problematic is defined.

Keywords: climatic division into areas; technique; multielement statistical analysis; meteorological network.

Tab. 1. Fig. 1. Ref. 9.

**Experimental and theoretical studies of the influence of aerosol particles in the submicron range on the electrical conductivity of air and the electric field of the atmosphere (review).** Morozov V. N. Proceeding GGO. 2015. Vol. 577. P. 47-64.

Provides an overview of domestic and foreign experimental to theoretical studies of the effect of aerosol particles on the electrical conductivity of air and the electric field of the atmosphere. Reduction in electrical conductivity in terms of aerosol pollution can give information about the concentration of aerosol particles, which manifests itself in the analysis of these changes observed in atmospheric-electric stations, which previously functioned on the territory of the USSR, are working currently, and similar foreign stations. In theoretical studies it is possible to highlight the problems associated with the calculation of the interaction of light atmospheric ions and aerosol particles and the construction of models that take into account the influence of the reduction of electric conductivity on the electric field in the electrode surface layer. and models global electric circuit in which change may be an important parameter, as the potential of the ionosphere.

*Keywords:* aerosol particles, electrical conductivity of air, electric field of the atmosphere

Tab. 1. Ref. 59.

**Geterogeneous processes of aerosols increase of the upper troposphere and stratosphere.** Ivlev L. S., Dovgaluk Ju. A. Proceeding GGO. 2015. Vol. 577. P. 65-105.

On the basis of analytical expressions for the electric potential of the ionosphere, following from the theory of the global electrical circuit in the atmosphere is estimated a change of this magnitude caused by the global distribution of aerosol particles in the atmosphere. It is shown that at concentrations of aerosol particles of  $10^{10}$ - $5 \times 10^{10} \text{m}^{-3}$ , the ionospheric potential is 8—10 % relative to the background values of this potential, equal to 300 KV. In this case, the electric field in regions remote from the field of aerosol pollution also increases by 8—10 % and may be an indicator of aerosol pollution of the atmosphere.

*Keywords:* sun activity, flow of the sun radiation, events of sun proton, absorption of polar cap, cosmic rays, cloud layer, gomogeneous and geterogeneous condensation, adsorbat, ion appearance, nucleus of condensation.

Tab. 1. Fig. 7. Ref. 49.

**The influence of the global distribution of aerosol particles in the electric potential of the ionosphere.** Morozov V. N. Proceeding GGO. 2015. Vol. 577. P. 106-112.

On the basis of analytical expressions for the electric potential of the ionosphere, following from the theory of the global electrical circuit in the atmosphere is estimated a change of this magnitude caused by the global distribution of aerosol particles in the atmosphere. It is shown that at concentrations of aerosol particles of  $10^{10}$ - $5 \times 10^{10} \text{m}^{-3}$ , the ionospheric potential is 8—10 % relative to the background values of this potential, equal to 300 KV. In this case, the electric field in regions remote from the field of aerosol pollution also increases by 8—10 % and may be an indicator of aerosol pollution of the atmosphere.

*Keywords:* aerosol particles, electrical potential of ionosphere, electrical field

Ref. 7.

**Theoretical aspects remote temperature measurement of road surface according to ir-radiometer.** Kuznetsov A. D., Seroukhova O. S., Simakina T. E., Solonin A. S. Proceeding GGO. 2015. Vol. 577. P. 113-126.

The article deals with the theoretical and practical aspects of remote temperature measurement of the roadway using infrared radiometers. An example of such remote temperature measurement for a 50-kilometer stretch of road St. Petersburg – Sortavala.

*Keywords:* remote temperature measurement, infrared radiometer, remote temperature measurement of the roadway coverage

Tab. 1. Fig. 2. Ref. 3.

**Development of automated system “KASMETEO” for dangerous weather phenomena forecasting and aviation meteorological support.** Dorofeev E. V., Zverev V. V., Lvova M. V., Tarabukin I. A. Proceedings of MGO. 2015. V. 577. P. 127-140.

This article describes the development of firmware information and measurement system “KASMETEO”. “KASMETEO” system is designed for aviation meteorological support and dangerous weather phenomena forecasting.

*Keywords:* aviation meteorological support, dangerous weather phenomena forecasting, firmware.

Fig. 3. Ref. 6.

**The results of comparative remote measurements of the atmospheric column-integrated precipitable water vapor.** Ipatov V. V., Tereb N. V., Rubtsov S. A., Shirotov V. V., Sizov N. I., Ilyin G. N., Bykov V. U., Stempkovsky V. G. Proceeding GGO. 2015. Vol. 577. P. 141-155.

In this paper we present the results of measurements of the atmospheric column-integrated precipitable water vapor (PW) obtained with a KAMA spectrophotometer and water vapor radiometer installed on the polygon of Altitudinal Meteorological Mast (AMM) IEM SPA "Typhoon". We present a brief description of the appliance and PW data, calculated by measuring the radio signal propagation delay of the global satellite navigation system (GPS). Comparison of the results of PW measurements, obtained by different hardware, showed good agreement.

*Keywords:* column-integrated precipitable water vapor, spectrophotometer, water vapor radiometer, results of measurements.

Tab. 1. Fig. 3. Ref. 16.

**Thermal regime forming for peat deposit within the north and northwest zones of oligotrophic bogs at the European Russia Territory under the climate changes.** Kalyuzhny I. L., Batuev V. I. Proceeding MGO. 2015 Vol. 577. P. 156-168.

Results of long observations on temperature regime of oligotrophic bogs at the north (Ilaskoe swamp) and at the westnorth (Lammin-Suo swamp) allowed to assess temporal and spatial changes in peat deposit thermal regime under climatic changes. It was determined that mean temperature of peat deposit increased at 0.6° C in the northwest part of the oligotrophic bogs zone and at 0.8° C in its north part. Dynamics of mean annual temperature at the peat deposit depth is defined by statistically significant positive trends. Depth of annual occurring temperature fluctuation increased at 0.68 m for the Lammin-Suo swamp and at 0.59 m for the Ilaskoe swamp. Annual temperature fluctuation for the Lammin-Suo swamp is observed up to the depth of 4.61 m, i.e. below the mineral swamp bottom (4.40 m).

*Key words:* swamp, peat deposit temperature, climate change

Tabl. 5. Fig. 2. Ref. 9.

**As for the role of atmospheric circulation in global climate processes.** Lapina S. N., Morozova S. V. Proceedings of MGO. 2015. V. 577. P. 169-178.

The article considers the changes in the area of the planetary front high-rise zone in two natural climatic periods of the Earth's climate system - the stabilization period and the second wave of the global warming. Connection between changes in the area of planetary front high-rise zone and wind regime in the hemisphere was detected.

*Keywords:* atmospheric circulation, climate processes, wind regime

Tab. 2. Fig. 3. Ref. 9.

**Investigation of cloud resources for extinguishing large forest fires in the Northwest region of Russian Federation.** Dovgaluk Ju. A., Veremei N. E., Ivanova K. M. Proceedings of GGO. 2015. V. 577. P. 179-196.

The results of investigation of days with resource clouds development amount are presented to estimate the possibility of active modifications performing to produce precipitations for forest fires extinguishing. Investigations were carried out for North-West Region of Russian Federation for warm period of 2005 – 2010. Calculations performed for data of 8 ground-based meteorological observation stations positioned near administrative centers of regions of North-West Region. Calculated data about days with fire danger of III – IV class count for warm period of 2005 – 2010 are presented. Probabilities of clouds development and fires occurring are estimated. Using statistical treatment of data allowed to determine the areas the most suitable for organizing extinguishing fires by artificial precipitations.

*Keywords:* active modifications, forest fires, resource clouds, fire hazard, fire frequency index, climate characteristics, percentage of forest land

Tab. 2. Fig. 8. Ref. 27.



**The methodology and results of aircraft impacts on the electrification of convective clouds.** Mikhailovsky, Yu. P. Proceedings of MGO. 2015. V. 577. P. 197-211.

The mechanism of impacts on the electrification of convective clouds by ice-forming reagent with alternate objectives (strengthening or weakening of electrification) is presented. Controllable parameters of the clouds are justified. Technique of randomized airplane seeding and control experiment and technique of efficiency estimation of carried out actions is described. Randomized airplane experiment on the seeding and analysis of its results show that the impact on the electrification of convective clouds by ice-forming reagent, carried out according to developed procedures, for the purpose both of amplification(acceleration) or suppression(slowing) of electrifying leads to statistically significant results.

Keywords: electrification of convective clouds, seeding, electric field, reflectivity, the plane, the effect of seeding.

*Keywords:* atmospheric circulation, climate processes, wind regime

Tab.1. Fig. 2. Ref. 15.