Investigation of the Electrical Structure of Cb with Hail using Three-dimensional Numerical Simulation (based on the case, observed in the north-west of Russia). Dovgalyuk Yu. A., Veremey N. E., Sinkevich A. A., Mikhailovsky Yu. P., Toropova M. L. Proceedings of MGO. 2019. V. 592. P. 7–22.

Numerical simulation of severe thunderstorm with hail, observed in Saint-Petersburg on 2017 July 22, was performed using modified numerical non-stationary three-dimensional model. Two cases were compared: without (1) and with (2) heterogeneous cloud droplets freezing. While taking this process into an account more intensive cloud electrification and charge separation is observed. The frequency of lightning discharges increases in 2—3 times. The polarity of the cloud becomes inverted (negative charge at the top, positive at the bottom). This effect was obtained for the first time by the authors, using a three-dimensional model. Electrical processes in the cloud have small effect on the occurrence of dangerous weather phenomena (rain, hail).

Tab. 2. Fig. 5. Ref. 9

The interaction of cloud charge structures with the surrounding conducting atmosphere with non-uniform electrical conductivity. Morozov V. N. Proceedings of MGO. 2019.V. 592. P. 23–79.

In the stationary and non-stationary approximations, the problem of calculating electric field by a cloud-based charge structure outside the cloud with allowance for electrical conductivity jumps at the cloud-free atmosphere boundary. For particular cases of the spatial distribution of electric cloud charges, we obtain approximate expressions for the electric field strength outside the cloud. The obtained theoretical results can play an important role in the interpretation of ground and aircraft measurements of the electric fields of clouds.

Keywords: electric fields of the atmosphere and clouds, electric field intensity, electrical conductivity of the atmosphere and clouds, oscillation frequency of the electric current of the cloud.

Ref. 15.

Comparison of the efficiency of detection of meteorological objects by two Doppler radars in the territory of the Leningrad Region. Voskanyan K. L., Zamorin I. S., Kryukova S. V., Kuznetsov A. D., Seroukhova O. S., Simakina T. E., Solonin A. S. Proceedings of MGO. 2019. V. 592. P. 80–97.

The efficiency of the algorithms used in the two DMRL Doppler meteorological radars in recognizing hazardous weather phenomena is considered. The analysis of the distance and azimuth of the weather, the number of cases with precipitation and thunderstorms on the performance of their detection. The spatial distribution of the probability of "false alarms" and the omissions of thunderstorms of two DMRLs was constructed, the regions with maximums of probabilities were localized.

Keywords: weather hazards, Doppler meteorological radars, detection of hazardous weather phenomena.

Tab. 3. Fig. 9. Ref. 13.

The results of the introduction of new methods in the laboratories of the Rosgidromet atmosphere pollution monitoring network. Kovacheva E. V., Sharikova O. P., Gurevich I. G. Proceedings of MGO. 2019. V. 592. P. 98–112.

The results of the introduction of new methods in the laboratories of the Rosgidromet atmospheric monitoring network (APMN) are presented. To assess the quality of analysis of samples in the network laboratories of monitoring atmospheric air pollution (LAPMN) Rosgidromet after the introduction of new methods used an analysis of external control as an important factor in assessing the reliability of observations on the network (APMN). The analysis and comparison of the results of external control for the period from 2016 to 2018 (using new methods) with the results of external control for the period from 2009 to 2014 (according to old methods) on the network of Roshydromet (APMN) for a number of impurities (pollutants). The presented results indicate an increase in the quality of analysis of samples in the LAPMN of Roshydromet with the introduction of new methods.

Keywords: monitoring of air pollution, methods for measuring concentrations of pollutants in atmospheric air.

Tab. 3. Fig. 4. Ref. 19.

Fire hazard forecast for the European territory of Russia based on hydrodynamic forecast of meteorological field values. Ladohina E. M., Aniskina O. G. Proceedings of MGO. 2019. V. 592. P. 113–128.

The indices were considered and analyzed, on the basis of which it is possible to predict fire hazard under weather conditions. A fire risk prediction system based on the results of hydrodynamic modeling of atmospheric processes using the hydrodynamic mesoscale model WRF is described.

Keywords: fire hazard, fire risk prediction, hydrodynamic modeling.

Tab. 3. Fig. 2. Ref. 13.

The conditions of appearance and prediction of wind storm in the city of Orsk and Petropavlovsk at the territory of the South-Ural railway. Vykhodtseva E. A., Novikova N. A., Ivanova I. A., Drobzheva, Y. V. Proceedings of MGO. 2019. V. 592. P. 129–140.

The results of the analysis of wind speed forecasts in Orsk and Petropavlovsk obtained on the basis of N.A.Lebedeva method are presented. The results of the calculation of the criteria for the success of wind speed forecasting for the period from 2008 to 2017 for the Orsk and Petropavlovsk showed that the method of N.A.Lebedeva is effective for predicting storm values of wind speed.

Keywords: wind, method, forecast, success.

Tab. 4. Fig. 1. Ref. 10

Changes in snow cover characteristics in the south of ETR as a response to global warming. Ashabokov B. A., Tashilova A. A., Keshiva L. A. Proceedings of MGO. 2019. V. 592. P. 141–158.

According to the data of the snow cover (SC) characteristics of the cold seasons for the period 1961-2012 in the south of the European part of Russia (EPR) there are obvious statistics, anomalous values, rates of change in the characteristics of the joint venture since 1961 and since 1976 to 2012 (beginning of global warming). A certain statistical difference (T-test) of the average values of the studied meteorological parameters and the corresponding climatic norms. linear trends of snow cover characteristics are constructed. It was found that during the studied period there was a tendency of growth of the average decade height of the snow cover and a tendency to decrease the duration of the occurrence of snow cover.

Keywords: average decade snow height, seasonal air surface temperature, linear trend, correlation coefficient, explained dispersion..

Tab. 2. Fig. 8. Ref. 11.

The results of the analysis of the simultaneous variability of the parameters of cosmic and terrestrial weather. Stupishina O. M. Golovina E. G**.** Proceedings of MGO. 2019. V. 592. P. 159–171.

The issue of the presented work is the variations of atmosphere characteristics those are synchronous to the variations of space weather parameters. The enter data are daily statistics of environmental parameters each of them are standardized to their season medians. Some elements of folding epoch method and elements of cluster analysis are used in the work. The results allow supposing the connection between the baric imbalance generation in atmosphere of the Saint-Petersburg region and the solar activity phase.

Tab. 4. Fig. 3. Ref. 9.

Electrical conductivity of air and meteorological visibility. Sterkhov P. L. Proceedings of MGO. 2019. V. 592. P. 172–180.

The monthly and average annual values of the specific total air conductivity at Voeikovo station and at Vostok station in Antarctica, obtained during the 34th and 36th Soviet Antarctic expeditions, are presented. The data for 1978-1996 are considered. The conductivity of air is compared with the meteorological visibility range and the interrelation of these quantities in the formation of annual and perennial variations is established.

Fig. 6. Ref. 9.