

Proceedings of the Main Geophysical Observatory: history and modernity.
Kattsov V. M., Makhotkina E. L. Proceedings of MGO. 2021. V. 600. P. 6–17.

The information about the publication of the journal "Proceedings of the MGO" from the moment of its appearance to the present time is given. The characteristics of the works presented in the 600th issue of the journal are given.

Keywords: Proceedings of MGO, history, modernity.

Methodological guideline for weather and climate risk assessment.
Rubinshtein E. S. Proceedings of MGO. 2021. V. 600. P. 18–29.

The basic principles of constructing a ground-based observation network are formulated.

Keywords: network planning, scientific planning, meteorological information.

Climatic factors of the external physical-geographical process. Budyko M. I.
Proceedings of MGO. 2021. V. 600. P. 30–57.

The climatic characteristics that determine the structure of separate natural processes and the level of development of the entire external physical-geographical process as a whole are analyzed. The main regularities of heat exchange and moisture exchange in the external physical-geographical envelope have been investigated.

Keywords: climatic parameters, heat exchange, moisture exchange, physical-geographical process, network planning, scientific planning, meteorological information.

Fig. 13. Ref. 17.

The first radiosonde. Selezneva E. S. Proceedings of MGO. 2021. V. 600. P. 58–78.

The history of the creation of a comb-shaped radiosonde by P. A. Molchanov is described in detail. It has been convincingly shown that the appearance of a radiosonde was crucial for the development of studies of the free atmosphere.

Keywords: Molchanov, radiosonde, free atmosphere.

Fig. 4.

On the issue of automation of control of meteorological data. Berlin I. A., Kagan R. L. Proceedings of MGO. 2021. V. 600. P. 79–86.

The question of the prospects and possibilities of monitoring the averaged values of meteorological elements on electronic computers is considered. A program of research that needs to be carried out for this purpose has been outlined.

Keywords: processing of observations, quality control, automation, analysis.

Fig. 1. Ref. 7.

On the issue of automation of control of meteorological data. Kagan R. L. Proceedings of MGO. 2021. V. 600. P. 87–94.

The accuracy of interpolation of the monthly averages of meteorological values is estimated.

Keywords: observation processing, quality control, spatial interpolation.

Tabl.2. Ref. 12.

Calculation of circulation, thermal conditions, and hydrological cycle in the atmosphere for July using an atmospheric general circulation model. Meleshko V. P., Shneerov B. E., Parshina G. V. Proceedings of MGO. 2021. V. 600. P. 95–120.

A new version of a hydrodynamical model of the general atmospheric circulation is described. The model takes into account the main processes of heat and moisture exchange: radiation transfer, interaction between the atmosphere and underlying surface, large-scale circulation and convection, hydrological conditions of the continental active soil layer, and horizontal diffusion.

A numerical experiment was carried out for a period of 60 days to calculate circulation, thermal conditions, and hydrological cycle in the atmosphere for July. The simulated characteristics of the atmosphere are compared with observations.

Key words: atmospheric general circulation model, thermal conditions, hydrological cycle, numerical experiment.

Tabl. 4. Fig. 7. Ref. 24.

On long-term integration of the atmosphere dynamics equations using nested grid approach. Magazenkov L. N., Sheinin D. A. Proceedings of MGO. 2021. V. 600. P. 121–146.

The main goal of this work is to construct a numerical scheme suitable for studying the regional climate by means of grid telescoping. A number of techniques are used to reduce the level of noise intensively generated at the boundary of the telescopic region: modifying the approximation of spatial operators in order to match the phase velocities of long waves outside and inside the telescopic region; employing a dissipative high-selective time integration scheme; filtering out short-wave increments.

The proposed scheme has been tested in the numerical experiments by integrating shallow water equations on nested grids. The analysis of stationary disturbances due to the orography inhomogeneities implies that there is a possibility of refining the time-averaged characteristics by means of telescoping.

Keywords: atmosphere dynamics, integration scheme, numerical experiments.

Fig. 5. Ref. 14.

On methods for determination of urban background air pollution. Berlyand M. E., Bezuglaya E. Yu., Genikhovich E. L. Zashikhin M. N. Onikul R. I. Proceedings of MGO. 2021. V. 600. P. 147–164.

The fundamentals of methods for determining the background pollution from observation data and its calculation based on the inventory of emission parameters are studied. Methods for excluding the contribution of a single source or a group of sources from the background are discussed. Formulas for calculating the background are given, which follow from the assumption of the lognormality of the concentration distribution function. Some practical recommendations on the application of the developed methodology are given.

Keywords: background pollution, urban atmosphere, determination methods.

Fig. 3. Ref. 17.

Calculation of a diffusion dispenser for liquid vapors. Volberg N. S. Proceedings of MGO. 2021. V. 600. P. 165—176.

A simplified equation is given that allows choosing optimal dosing conditions for a specific task. Formulas are given that allow us to calculate: the outer diameter of the diffusion tube, the diameter of the existing tube, the optimal temperature of the temperature control, the temperature correction of the density of the dosed liquid, the duration of the cell to reach the stationary mode and determine the minimum flow rate of the diluent gas that prevents the condensation of the dosed substance.

Keywords: diffusion dispenser, optimal dosing conditions.

Tabl.1. Fig. 1. Ref. 12.

Universal ozonometer. Gushchin G. P. Proceedings of MGO. 2021. V. 600. P. 177–200.

A description of the method and instrument for measuring the total ozone content is presented. A nomogram is used to simplify the ozone calculation. The results of comparisons of the universal ozonometer with other devices are presented.

Keywords: total ozone, measuring device, measurement method, comparison results.

Tabl. 2. Fig. 8. Ref. 15.

Optical method for the determination of the total CO₂ content in a vertical column of the atmosphere. Brounshtein A. M., Paramonova N. N., Frolov A. D., Shashkov A. A. Proceedings of MGO. 2021. V. 600. P. 201–227.

An optical method for determining the total CO₂ content from the absorption spectra of solar radiation passing through the atmosphere is proposed. The errors of the method are considered. The results of the implementation of the method at the ICAU facility in Voeikovo are presented.

Keywords: optical method, total CO₂ content, average concentration.

Tabl. 4. Fig. 5. Ref. 27.

Lightning discharges statistics. Makhotkin L. G., Semenov K. A. Proceedings of MGO. 2021. V. 600. P. 228–241.

General statistical estimates were used to investigate the characteristics of various instruments that register lightning discharges. Data were obtained on the dependence of the magnitude of the field strength jump on the distance to the discharge, the distribution of field jumps by magnitude, the influence of the threshold value on the number of received discharges.

The results of comparing the calculated and experimental data confirm the correctness of the chosen statistical scheme

Keywords: lightning discharges, electric field strength, statistical estimates.

Tabl. 1. Fig. 5. Ref. 7.

On experiments in extinguishing (localizing) forest fires by active influence on clouds. Sumin Yu. P. Proceedings of MGO. 2021. V. 600. P. 242—263.

The experience of the first attempts to use the method of precipitation enhancement to control forest fires is generalized. It is shown that the method is most effective for extinguishing (localizing) large forest fires that have existed for a long time.

Keywords: convective clouds, precipitation enhancement, forest fires.

Tabl. 1. Fig. 5. Ref. 7.