

Climatic zoning of the Novosibirsk region. Pigoltsina G. B., Zadornyykh V. A., Faselko D. V. Proceedings of the GGO. 2023. V. 610. P.8–24.

Climatic zoning of the Novosibirsk region was carried out based on an assessment of the spatial variability of climatic indices. Meteorological observations data in recent years were taken into account. Thirteen areas have been identified. For each of them, a wide range of basic and tailored climatic indices has been defined. This will allow users of climate information to make informed business decisions, differentiated by individual areas of the region.

Keywords: climatic zoning, tailored climate indices, microclimatic variability

Fig. 3. Tab. 4. Ref. 11.

Modeling of regional climate impacts on actual evaporation over the European part of Russia. Nadyozhina E. D., Shkolnik I. M., Sternzat A. V., Pikaleva A. A. Proceedings of the GGO. 2023. V. 610. P. 25–47.

The relationship between actual evaporation and apparent potential evaporation (the complementary relationship) is widely used to estimate actual evapotranspiration values from standard meteorological observations. The assessment of this relationship has been generalized to the case of a heterogeneously moistened land surface using actual evaporation data calculated using the atmospheric boundary layer model (ABLM). Climatic characteristics in the European part of Russia in the regular grid of the MGO regional climate model are used as an input in ABLM. The dependence of the relationship on the scale of spatial and temporal averaging of the calculated data is shown. Regional differences in the calculations of the complementary relationship performed for the taiga zone and for the steppe zone are analyzed. Estimates of the spatial distributions of actual evaporation are obtained using different approaches to calculating the complementary relationship.

Keywords: complementary relationship, estimation, evaluation, evapotranspiration

Fig. 7. Ref. 29.

The use of devices based on low-cost sensors to measure concentrations of pollutants in the atmospheric air. Zagainova M. S., Ivanchenko K. V., Chicherin S. S., Chelibanov V. P., Yanovsky I. S. Proceedings of the GGO. 2023. V. 612. P. 48–75.

The article examines the world and Russian experience in the operation of low-cost sensors. Currently known attempts in different countries of the world, including the Russian Federation, to justify the possibility of using sensors instead of reference measuring instruments (or proof of their equivalence) in the area of regulatory monitoring of atmospheric air pollution have not had positive results. However, the sensors are capable of solving a number of special and auxiliary tasks outside the area of state monitoring of atmospheric air, including as part of high-density signal networks.

Keywords: low-cost sensors, air pollution, monitoring station, measurement methods, pollutants, air quality, calibration.

Ref. 13

Effective schemes for calculating maximum single concentrations with non-stationary and asynchronous emissions of sources and considering the moving sources. Ziv A. D. Proceedings of the GGO. 2023. V. 610. P. 77–101.

The Russian air pollution regulatory model for short-term concentrations (20 minute averaging) does not handle air pollution sources with non-stationary emissions asynchrony emissions and sources with variable location. However, in practice there are cases when those sources are to be taken into account. Thus, it is needed to find the most unfavorable configuration. Current paper proposes several approaches to avoid the direct search. It is considered in particular the asynchronous movement of the several sources, e.g. of the ships in the harbor.

Keywords: maximum concentrations, non-stationary sources, moving sources

Fig. 2. Ref. 13.

Possible changes in the total ozone content and other parameters of the Antarctic stratosphere according to the SOCOL v4 model. Imanova A. S., Smyshlyaev S.P., Rozanov E. V., Frolkis V. A. Proceedings of the GGO. 2023. V. 610. P. 102–112.

An analysis of the behavior of total ozone content and other parameters of the stratosphere for the Antarctic region from 2015 to 2099 was carried out based on data from the SOCOLv4 model using a moderate greenhouse gas emissions scenario (SSP 2-4.5). The following were considered: total ozone content, temperature, zonal wind speed, content of chlorine and bromine components. It is shown that the ozone content in the Antarctic region in the future has a statistically significant positive trend, which is mainly due to a decrease in the content of chlorine and bromine components.

Keywords: stratospheric ozone, polar vortex, Antarctica, numerical modeling, SOCOLv4, climate change.

Fig. 3. Ref. 21.

Criteria for sampling data on atmospheric electricity for the Polar regions in order to automate their processing and control Zaynetdinov B. G. Proceedings of the GGO. 2023. V. 610. P. 113–125.

The article presents a statistical substantiation of the criteria for sampling data on the electric field strength of the surface layer of the atmosphere for high-latitude observation stations under normal hours. The results obtained can be used to automate the process of processing and monitoring incoming information about atmospheric electricity.

Keywords: atmospheric electric field, meteorological phenomena, information processing.

Tabl. 5. Fig. 3. Ref. 8.

A new approach for transferring units of measurement of meteorological optical range to nephelometers6. Zimenkov P. S. 2023. V. 610. P. 126–137.

A new concept of nephelometer calibration and a device for linearity checking of nephelometer transmitter-receiver optical system is proposed. For the measurement unit transfer from a reference transmissometer to a reference nephelometer the using of a transmissometer with a very short measurement baseline is proposed. Also it is proposed to do a transfer of the measurement unit in laboratory conditions, which characterized with stable and reproducibility measurement results (in a Fog Chamber). A hierarchy scheme for the measurement unit transfer to a field nephelometers is proposed.

Keywords: nephelometer, transmissometer, hierarchy scheme, infrared filter, diffusing plates, diffusion coefficient, directional transmittance coefficient, fog chamber.

Fig. 3. Tab. 1. Ref. 5.

Imitator of light scattered by aerosol for testing nephelometer type sensors. Starodubov A. G., Yakovlev V. S., Rodionov A. A. Proceedings of the GGO. 2023. V. 610. P.138–147.

A description of the imitator of light scattered by an aerosol for testing nephelometer-type sensors and the results of its testing are given. The imitator allows to check the accuracy of a nephelometer's measurements over its entire range.

Keywords: meteorological optical range, MOR, nephelometer, calibration.

Tab. 2. Fig. 3. Ref. 5.

Studies of the specific electric charge on zinc oxide particles. Budaev A. Kh. Proceedings of the MGO. 2023. V. 610. P. 148–159.

Laboratory experiments were conducted to study the effect of the electric field strength of a flat capacitor on the specific electric charge of zinc oxide particles.

A set of equipment and methods have been developed for conducting experiments, which have shown that the absolute value of the charge on negatively charged particles is greater than on positively charged ones.

It is found that when an electric field strength of 48 kV/cm is reached, the acquired charge transitions from negative to positive. Most likely, when a particle collides with a positively charged plate, an oxide film breaks through on its surface, and the particle acquires a significant positive charge.

The errors associated with the deposition of reagent particles on the capacitor plates at different field values are calculated. The total error is $\pm 10\%$. Thus, the deposition of reagent particles on the capacitor plates does not significantly affect the values of the specific yield of the reagent.

Keywords: zinc oxide, electric charge, electric field strength, reagent, ice-forming particles, specific yield.

Table 1. Fig. 5. Ref. 16.

Economic aspects of application of mobile impact points in Stavropol anti-hail service. Alita S. L., Appaeva Zh. Yu., Shapovalov V. A. Proceedings of the MGO. 2023. V. 610. P. 160–170.

The article investigates the issue of cost-effectiveness of the use of mobile hail impact points in the Stavropol hail service. The maximum number of mobile impact points, which, from the economic point of view, is reasonable to deploy to increase the efficiency of anti-hail operations, is determined. The article also evaluates the payback period of measures related to the deployment of this number of mobile impact points and defines the areas of their possible deployment.

Keywords: mobile impact point, average annual damage, protected area, profitability, payback period.

Tab. 3. Fig. 1. Ref. 6.

Method of using mobile points of influence on hail processes in the Krasnodar anti-hail service. Alita S. L., Live K. B. Proceedings of the GGO. 2024. V 610. P. 171–179.

The article describes several typical cases of hail skipping in the Krasnodar anti-hail service over the past few years, which have caused significant damage to agricultural crops. In all these cases, the formation and development of hail clouds occurred outside the protected area, outside the range of anti-hail missiles. To reduce the risks of such a development in the future, the article suggests using several mobile points of influence on hail processes located in the places of the most frequent formation of hail clouds.

Keywords: hail cloud, layout, mobile impact point, active impact, protected area, anti-hail missile.

Fig. 3. Ref. 4.