Radar and satellite observations of the Cb merging and precipitation from them. Sinkevich A. A., Matrosov S. Yu., Popov V. B., Mikhailovskii Yu. P., Dovgalyuk Yu. A., Veremei N. E. Proceedings of MGO. 2018. V. 591. P. 7—24.

Changes in the characteristics of two Cb clouds and corresponding precipitation as a result of cloud merging are studied. Cloud microstructure is analyzed. It was found that Cb merging noticeably changed temporal trend of cloud characteristics. Cloud top height, radar reflectivity and supercooled cloud volume increased as a result of merging. Maximum precipitation intensity inferred from radar data and, calculated from satellite radiometric measurements, increased by a factor of 1,5—2, and the precipitation flux by a factor of 2—4 after cloud merging.

Fig. 6. Ref. 19.

Investigation of the Relationship of Electrical Discharges Frequency with Radar Characteristics of Multicell Cb. Sinkevich A. A. Michailovsky Yu. P., Abshaev A. M. Proceedings of MGO. 2018. V. 591. P. 25—41.

Detailed study of the relationship of electrical discharges frequency with radar characteristics of thunderstorm with hail was carried out. Data of remote measurements (radar, lightning detection network and radiometer) were used. Close correlation between the frequency of electrical discharges and supercooled cloud volume with reflectivity greater than 35 dBZ was found.

Maximum lightning frequency was equal to 32 min^{-1} in the studied cloud. At this time, 4.6 intra-cloud discharges account for only 1 cloud–to–cloud or cloud-to-earth discharge. Cloud top was equal to 12.8 km, maximal reflectivity — 60 dBZ, precipitation intensity — 66 mm/h.

Fig. 3. Ref. 17.

Experimental study of measurement accuracy of wideband direction finders thunderstorms. Snegurov A. V., Snegurov V. S. Proceedings of MGO. 2018. V. 591. P. 42—81.

The results of experimental research of measurement errors of the azimuth broadband direction finders thunderstorms. It is shown that the systematic measurement error varies from 22—23 to 37 degrees. At distances from 100 to 2000 km, the error varies from 10 to 32 degrees. From 10 to 100 km error is reduced from 35 to 15 degrees. This can be explained by the polarization effect.

Keywords: wideband direction finders, electromagnetic radiation of lightning, bearing measurement errors.

Physical-statistical model of single-cell hail clouds and precipitation according to radar observations. Appaeva Z. Yu. Proceedings of MGO. 2019. V. 591. P. 82—91.

64 convective cells (CCs) were identified within 100 km radius of the locator survey based on the results of radar studies of thunderstorm processes using «ASU – MRL», observed in the North Caucasus during the summer periods of 2011—2016.
The physico-statistical model of single-cell hail clouds is based on a summary of raar observations.

Keywords: Radar, single-cell hail clouds, physical and statistical model, distributions of the main radar parameters, precipitation.

Variations of the atmospheric electric field due to harmonic currents of thunderstorm generators in the model of the global electrical circuit in the atmosphere. Morozov V. N. Proceedings of MGO. 2018. V. 591. P. 92—104.

The paper presents a mathematical solution to the problem of the influence of harmonic oscillations of currents of thunderstorm generators on the electric field of the atmosphere. The obtained solutions show that in the case of very low oscillation frequencies, a quasistationary mode of oscillations takes place, when the conduction currents are significant in the dynamics of the electric field of the atmosphere. In the case of very high frequencies, the main contribution to the oscillations of the electric field is made by bias currents and variations of the electric field are of Coulomb nature. In the intermediate case, two spherical regions arise due to an increase in the electrical conductivity of the atmosphere, the Coulomb approximation works in the lower region, and the conductivity flows in the upper region. For these cases, approximate expressions are obtained for the ionospheric potential.

Tabl. 1. Ref. 8.

Application of the empirical orthogonal functions for the analysis of the lager-scale dynamical processes in the middle atmosphere. Rakushina E. V., Aniskina O. G., Kandieva K. K., Pogoreltsev A. I. Proceedings of MGO. 2018. V. 591. P. 105—123.

The application of Empirical Orthogonal Functions (EOFs) approach to analyze the middle-latitude stratosphere response to the Quasi Biennial Oscillation (QBO) and Madden — Julian Oscillation (MJO) has been considered. There have been detected four types of QBO in the vertical profile of the zonal mean wind, which could be used in a study related to influence of QBO on atmosphere processes at the middle and high latitudes. Application of the EOFs analysis of combined field has been demonstrated to investigate the MJO manifestation in the stratosphere.

Keywords: Empirical orthogonal functions, QBO and MJO.

Fig. 7. Tab. 1. Ref. 15.

Estimation of possibilities of GIS-technology for positioning of meteorological observation ITEMS. Voskanan K. L., Kuznetcon A. D., Serouhova O. S., Simakina T. E. Proceedings of MGO. 2019. V. 591. P. 124—140.

The possibilities of using geographic information technologies when choosing places for installing meteorological radar stations and locating automatic ground meteorological stations are considered. Using a specific territory as an example, a search and localization of potentially suitable locations corresponding to existing requirements was carried out. The methods of geographic information technologies used are recommended for automating the finding of optimal locations for observation points.

Keywords: meteorological radars, meteorological stations, geo-information technologies, choice of position for radars.

Fig. 13. Ref. 13.

Risks to public health from the effects of heatwaves at the south-east of western Siberia and problems of adaptation. Luchitskaya I. O., Belaya N. I. Proceedings of MGO. 2018. V. 591. P. 141—156.

The article deals with the regional aspects of assessing the risk of harming the population health of the created by the waves of heat, based on the analysis of influencing factors — susceptibility and vulnerability. The optimal risk criterion for the effects of heat waves in the continental climate of the region is substantiated. The trends towards a change in the frequency of heatwaves were investigated, the list of risk groups among the population was updated based on the specifics of socio-economic activities of the subjects. On the example of the vulnerable category (people aged 65 years and older), the estimates of social risk and economic damage from the effects of heat were obtained and compared with statistical data of clinical consequences in different manifestations and indicators of financial expenditures. A package of measures for adaptation of health care structures and social services is proposed taking into account climatic and demographic trends.

Keywords: abnormal heat, public health, risks, adaptation, specialized database.

Fig. 4. Tabl. 4. Ref. 16.

Ionospheric guiding of decamenic radio waves. Kalinin Yu. K.., Repin A. Yu., Khotenko E. N., Shchelkalin A. V. Proceedings of MGO. 2018. V. 591. P. 156—166.

The exact solution of Maxwell's equations for field of ground axial symmetric emitter decameter radio waves in a spherically symmetric three-layer environment is considered at the ionospheric heights as a source of surface waves moving along the inner surface of the ionosphere. Analysis of the structure of the zonal harmonies and the integration contour in the integral Watson allows you to highlight the components of the moving waves as a superposition of helical waves and waves in zonal harmonics, "adherent" to the concave surface of the ionosphere. Substantiates the hypothesis of transfer this approach to the case of five-layer ionosphere.

Keywords: ionosphere and decameter radio waves, ionospheric guiding, sliding wave, Watson's integral.

Fig. 3. Ref. 17.

Superposition of helio-geophysical disturbances and aviation perturbations. Kalinin Yu. K.., Repin A. Yu., Khotenko E. N. Proceedings of MGO. 2018. V. 591. P. 167—172.

The method of overlapping epochs establishes links between helio-geophysical disturbances (HGD). They are: solar flashes, magnetic storms, strong earthquake and aviation perturbation (AP). In some cases, superposition of HGD, which coincides in time with AP, arises. Examples of such coincidents are given. An idea of "helio-geophysical pits" is introduced. It is a short period of sharp decrease in safety of aviation functioning, which is associated with superposition of HGD.

Fig. 3. Ref. 2.

Natural research hydrological characteristics right river flow Cherek Bezengiski. Batchaev I. I., Chigirova L. B. Proceedings of MGO. 2018. V. 591. P. 173—182.

The description is given of the location of the study area with the definition of the main hydrological and morphometric characteristics, such as: water flow, flow rate, catchment area, length, slope, affecting the formation of channel processes during mudflows. Five lateral tributaries have been identified, along which mudflows (of predominantly water-stone type) of low and medium thickness regularly flow down, which carry a large amount of mudflow material into the main riverbed of Ushkhar Suu. The calculations of water flow and mudflow in the area of the bridge in the lower reaches of the Ushkhar Suu river are given. The threat of erosion and blockage of the Babugent-Bezengi highway was revealed, leading to a break in ground communication with the above-located two rural settlements, the border town and the Bezengi high-altitude camp.

Fig. 5. Tab. 1. Ref. 7.