

PREFACE

This topical issue of the journal of *Atmospheric and Oceanic Optics* is the third one of such issues dealing with the problem of climate and ecological monitoring of the atmosphere over local areas. This issue is devoted to the further consideration of various problems of mesometeorology, as well as to ecology and climate on a regional scale.

Thus, in the first two papers by V.S. Komarov and A.V. Kreminskii an original approach is considered to the solution of the problem of objective analysis of the 3D structure of mesometeorological fields. This approach is based on the optimal combining of two alternative methods of spatial interpolation (the method of optimal interpolation and the MCA). One of the possible algorithms of an efficient arrangement (from the viewpoint of the needs of the objective analysis of mesometeorological fields) of a network of aerological stations is considered in this papers as well.

The papers by P.N. Belov and V.S. Komarov deal with the numerical methods for describing the spread of atmospheric pollutants exhausted from motor vehicles or transported from the planetary boundary layer to the upper atmosphere. V.S. Komarov, S.A. Soldatenko, and O.M. Sobolevskii in their paper propose models of the cloudiness evolution and atmospheric pollution spread that are based on the systems of the complete equations of thermodynamics and the equation of turbulent diffusion.

A number of papers deal with the problems of atmospheric pollution monitoring over industrial areas. In particular, N.A. Merkur'eva in her paper presents the results of statistical analysis of NO₂, SO₂, H₂S, and dust contents in the air basin over the city of Naberezhnye Chelny. Presented in the paper by B.D. Belan, D.V. Simonenkov, and G.N. Tolmachev are the actual (measured from onboard the instrumented airplane) data on the chemical composition of aerosol in a number of regions of Russia and Kazakhstan. At the same time, the paper by B.D. Belan considers the calculated concentrations of pollutants estimated from the data of airborne sounding and the composition and the volume of atmospheric emissions in Pavlodar. The paper by Yu.L. Matveev analyzes the influence of the meteorological conditions on the vertical profiles and flows of atmospheric pollutants.

An interesting problem of ecological safety of a region is considered in the paper by B.D. Belan, V.E. Zuev, and M.V. Panchenko.

The works of climatic direction are also presented by a number of articles. So considered in the paper by V.S. Komarov, A.V. Kreminskii, et al. is the computer informational base of regional climatic models of the temperature and the wind for the boundary atmospheric layer. A.A. Isaev and N.V. Zukert propose an empirical model for estimating the month precipitation volume and the number of days with precipitation from the data of "Meteor" satellite. The paper by V.S. Komarov, A.A. Isaev, and B.G. Sherstyukov considers the methodology for modeling the climatic characteristics of the cold season (its beginning, end, duration, and average temperature) and their forecasting based on the method of multiple cyclicity. B.G. Sherstyukov in his paper studies the variations of anomalies in the annual temperature behavior in the northern latitudes at different conditions in space.

In addition, this topical issue brings to reader's notice a number of articles devoted to other problems of a climatic and ecological monitoring. For example, V.I. Akselevich and A.V. Tertyshnikov propose an original approach to estimating the seismic regime from the data on the spectral transmittance of the atmosphere, whereas G.I. Mazurov and Yu.L. Matveev consider various aspects of formation and evolution of anthropogenic and artificial clouds and fogs, as well as condensation traces, clouds, and fogs. The paper by V.S. Komarov, A.V. Kreminskii, et al. deals with the analysis of results on using the measurement data of the three-path correlation lidar in the problems of statistical forecast of wind in the boundary atmospheric layer.

Bringing this topical issue to your notice, its compilers anticipate that all materials presented here will be interesting for broad sections of readers dealing with the problems of numerical modeling and forecast of mesometeorological fields, atmospheric-ecological monitoring, climate modeling, etc.

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