

PREFACE

The current state of the art in the development of mesometeorology and regional ecology is characterized by much attention focused not only on the problems of ecological monitoring of the environment upon exposure to anthropogenic pollution, but also on the problems of objective analysis and prediction of mesometeorological fields (and primarily the fields of temperature and wind velocity) affecting the pollutant transfer at local-regional level, numerical simulation of spatial spreading of atmospheric pollutants, and prediction of evolution of pollution level.

The present topical issue of the journal is mainly dedicated to a consideration of different aspects of solution of the above problems. Thus, in the first paper by V.S. Komarov and A.V. Kreminskii, an original approach is proposed to the solution of the problem of reconstruction of mesometeorological fields in territories uncovered with observational data, and the second paper is dedicated to the discussion of the results of numerical experiments on estimating the quality of spatial forecast of vertical profiles of the temperature and wind velocity performed on the basis of optimal combination of alternative methods (polynomial approximation, optimal extrapolation, and modified method of clustering of the arguments) according to the data of aerological observations of a typical mesometeorological polygon.

A.A. Isaev investigates the feasibility for revealing the prognostic parameters of time hydrometeorological series as applied to the problems of atmospheric and ecological monitoring.

A number of papers describes the problems of pollutant transport. In particular, the paper by P.N. Belov considers the method of reconstruction of the average spatiotemporal field of air pollution over the areas uncovered with measurements of the pollutant concentration with the availability of climatic data. The paper by P.N. Belov and V.S. Komarov analyzes the results of application of the trajectory model to the problem of numerical estimate of pollutant transport at long distances. V.S. Komarov, S.A. Soldatenko, and S.S. Suvorov propose an original approach to the study of sensitivity of models of conservative pollutant transport in the atmosphere. S.A. Soldatenko et al. in their paper describe the problem of identification of pollutants in the absence of *a priori* information on location, type, number, and strength of sources. In his paper, R.F. Rakhimov discusses some methodical aspects of the problem of simulation of aerosol processes determining the spatiotemporal variation of optical characteristics of atmospheric aerosol. V.S. Komarov, S.A. Soldatenko, and A.N. Borisov consider the basic peculiarities of imitational system oriented to modeling and prediction of dynamics of cloud fields and anthropogenic aerosol formations for solving the problems of providing meteorological information support for optical-electronic systems of global observation of the Earth.

Along with the above-mentioned, the present topical issue of the journal contains the papers describing the results of consideration of alternative problems of atmospheric monitoring. Some authors (V.S. Komarov, V.I. Akselevich, et al.; A.I. Grishin, A.E. Zil'berman, and G.G. Matvienko; A.I. Grishin and G.G. Matvienko) devoted their papers to practical applications of the results of lidar sensing of the atmosphere. And E.V. Yarkho investigates salient features of seasonal variability of aerosol optical thickness of the atmosphere derived from the data of 155 actinometric stations located in different climatic regions. S.M. Sakerin and D.M. Kabanov in their paper analyze the variability of flux of total and spectral solar radiation in the Tomsk region, and E.N. Nezval' describes the variation of the incoming UV radiation and gives the estimate of its trends as a whole for a year and in warm and cold seasons in Moscow.

In their paper, V.I. Akselevich and A.V. Tertysnikova discuss some methodical aspects of application of the ozonometry data for prediction of violent earthquakes.

A.I. Brodovich, S.A. Ikonnikov, et al. propose the method of processing of satellite video images based on data flow splitting. And finally, in the concluding paper of this topical issue, Yu.V. Gridnev and K.T. Protasov consider some peculiarities of processing of aerospace images of the Earth's underlying surface and cloudiness.

Presenting this thematic issue, the compilers hope that the materials included in it will be interesting for a wide class of researchers dealing with various problems of numerical simulation and forecast of mesometeorological processes and fields as well as with problems of ecological monitoring of the atmosphere.

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