PREFACE

The Eleventh Symposium on Laser Radiation Propagation through the Atmosphere and Water Media was held in Tomsk 22—24 June, 1993. This traditional Symposium has been organized by the Institute of Atmospheric Optics of the Siberian Branch of the Russian Academy of Sciences every two years since 1971. Scientific reports from 42 institutions in 24 cities of Russia and Commonwealth of Scientific Independent States were presented at this Symposium. These reports contained new theoretical and experimental results mainly on the problem of wave propagation through the atmosphere. Materials of this Symposium provided the basis for the present thematic issue of the journal *Atmospheric and Oceanic Optics* including the most interesting and valuable works.

In accordance with topics of the Symposium, the subject of this issue is formed by the papers in the following directions:
— atmospheric turbulence,
— scattering and transfer of optical waves through the atmosphere,
— nonlinear optical phenomena in the atmosphere,
— research instruments and measurement techniques,
— remote sensing of the atmosphere and underlying surface.

The review paper by G.Ya. Patrushev and O.A. Rubtsova, in which existing models of the laws of distibution of the light intensity fluctuations and real measurement accuracy of the statistical characteristics of laser radiation field in the turbulent atmosphere are analyzed, opens this issue.

The paper by A.G. Borovoi is devoted to the analysis of the limits of applicability of the smooth perturbation method, which is widely used in the theoretical study of short—wave propagation through randomly inhomogeneous media. The rest of the papers on atmospheric turbulence are devoted to the study of particular phenomena accompanying ultrashort and optical wave propagation through randomly inhomogeneous media.

The block of papers on scattering and transfer of optical waves through the atmosphere is opened with the paper methods by A.N. Valentyuk, in which analytical methods in the theory of radiation propagation through macro—inhomogeneous stochastic scattering media are reviewed. The theory of radiation transfer through such media is currently beginning to develop; therefore, the paper by A.N. Valentyuk, in which the basic ideas of available approaches are given and the ways of further development of analytic theory are proposed, is of pressing interest.

In the direction of nonlinear optical phenomena in the atmosphere the papers by A.A. Zemlyanov and Yu.E. Geints and Yu.E. Danilov, V.A. Markel', and V.P. Safonov should be mentioned. The first paper presents the results of numerical modeling of explosive effervescence of large water droplets upon exposure to laser radiation. The calculated absorption spectra for clusters are compared with the experimental spectra of silver hydrosols in the second paper. The calculations are based on the method developed by the authors and relying on the definite models of random fractal clusters employed in the study of nonlinear optical medium.

The last four papers of this issue are devoted to the techniques for measuring the parameters of laser radiation and applied aspects of investigations on optical radiation propagation through the atmosphere.

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