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Gennadii G. Matvienko Oleg A. Romanovskii Editors

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- M. V. Panchenko, V.E. Zuev Institute of Atmospheric Optics SB RAS (Russian Federation)
- V. V. Penenko, Institute of Computational Mathematics and Mathematical Geophysics SB RAS (Russian Federation)
- Y. N. Ponomarev, V.E. Zuev Institute of Atmospheric Optics SB RAS (Russian Federation)
- A. P. Potekhin, Institute of Solar-Terrestrial Physics SB RAS (Russian Federation)
- S. Rahm, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany)
- J. C. Ricklin, Defense Advanced Research Projects Agency (United States)
- M. C. Roggemann, Michigan Technological University (United States)
- I. V. Samokhvalov, National Research Tomsk State University (Russian Federation)
- U. N. Singh, NASA Langley Research Center (United States)
- L. N. Sinitsa, V.E. Zuev Institute of Atmospheric Optics SB RAS (Russian Federation)
- O. K. Steinvall, Swedish Defence Research Agency (Sweden)
- G. F. Tulinov, Fedorov Institute of Applied Geophysics (Russian Federation)
- M. A. Vorontsov, University of Maryland (United States)
- Gengchen Wang, Institute of Atmospheric Physics CAS (China)
- A. A. Zemlyanov, V.E. Zuev Institute of Atmospheric Optics SB RAS (Russian Federation)

#### Session Chairs

- Molecular Spectroscopy and Atmospheric Radiative Processes
  Yu. N. Ponomarev, V.E. Zuev Institute of Atmospheric Optics SB RAS (Russian Federation)
  - L. N. Sinitsa, V.E. Zuev Institute of Atmospheric Optics SB RAS (Russian Federation)
  - T. M. Petrova, V.E. Zuev Institute of Atmospheric Optics SB RAS (Russian Federation)
- 2 Optical Radiation Propagation in the Atmosphere and Ocean
  V. P. Budak, Moscow Power Engineering Institute (Russian Federation)
  - V. P. Budak, Moscow Power Engineering Institute (Russian Federation
  - V. P. Belov, V.E. Zuev Institute of Atmospheric Optics SB RAS (Russian Federation)

- V. P. Lukin, V.E. Zuev Institute of Atmospheric Optics SB RAS (Russian Federation)
- A. A. Zemlyanov, V.E. Zuev Institute of Atmospheric Optics SB RAS (Russian Federation)
- V. A. Banakh, V.E. Zuev Institute of Atmospheric Optics SB RAS (Russian Federation)
- A. M. Kabanov, V.E. Zuev Institute of Atmospheric Optics SB RAS (Russian Federation)
- 3 Optical Investigation of Atmosphere and Ocean
  - G. G. Matvienko V.E. Zuev Institute of Atmospheric Optics SB RAS (Russian Federation)
  - I. V. Samokhvalov, National Research Tomsk State University (Russian Federation)
  - V. N. Marichev, V.E. Zuev Institute of Atmospheric Optics SB RAS (Russian Federation)
  - **A. A. Tikhomirov**, Institute of Monitoring of Climatic and Ecological Systems (Russian Federation)
  - **O. A. Romanovskii**, V.E. Zuev Institute of Atmospheric Optics SB RAS (Russian Federation)
- 4 Atmospheric Physics and Climate
  - **B. D. Belan**, V.E. Zuev Institute of Atmospheric Optics SB RAS (Russian Federation)
  - V. A. Kovalenko, Institute of Solar-Terrestrial Physics SB RAS (Russian Federation)
  - V. V. Penenko, Institute of Computational Mathematics and Mathematical Geophysics SB RAS (Russian Federation)
  - S. A. Kolesnik, National Research Tomsk State University (Russian Federation)
  - A. V. Soloviev, National Research Tomsk State University (Russian Federation)
  - V. V. Zavoruev, Institute of Computational Modeling (Russian Federation)

# Introduction

In accordance with the schedule of meeting and conferences approved by the Presidium of the Siberian Branch of the Russian Academy of Sciences (SB RAS) for 2015, the V.E. Zuev Institute of Atmospheric Optics SB RAS and Institute of Solar-Terrestrial Physics SB RAS organized the Twenty-first International Symposium titled "Atmospheric and Ocean Optics: Atmospheric Physics" in Tomsk, Russian Federation, 22–26 June 2015.

We wish to thank our sponsors for their contribution to the success of the symposium: Siberian Branch of the Russian Academy of Sciences and the Russian Foundation for Basic Research.

English and Russian were the working languages of the symposium. All poster presentations were in English and oral presentations were made in English and Russian (using synchronous translation via personal audio-equipment).

We conducted four conferences titled:

- 1. Molecular Spectroscopy and Atmospheric Radiative Processes
- 2. Optical Radiation Propagation in the Atmosphere and Ocean
- 3. Optical Investigation of Atmosphere and Ocean
- 4. Atmospheric Physics and Climate

The main topics of the Twenty-first International Symposium on Atmospheric and Ocean Optics/Atmospheric Physics included:

- Molecular spectroscopy of atmospheric gases
- Absorption of radiation in atmosphere and ocean
- Radiative regime and climate problems
- Models and databases for atmospheric optics and physics
- Wave propagation in random inhomogeneous media
- Adaptive optics
- Nonlinear effects at radiation propagation in atmosphere
- Multiple scattering in optical remote sensing
- Image transfer and processing
- Optical and microphysical properties of atmospheric aerosol
  and suspension in water media
- Transport and transformation of aerosol and gas components in the atmosphere
- Laser and acoustic sounding of atmosphere and ocean
- Diagnostics of state and functioning of plants bio systems
- Structure and dynamics of the lower and middle atmosphere
- Dynamics of the atmosphere and climate of the Asian region
- Physical processes and phenomena in the atmosphere
- Optic techniques for probing the atmosphere

History: A symposium on Atmospheric and Ocean Optics has been held annually since 1994 by the Institute of Atmospheric Optics SB RAS. From 1971 to 2014 the IAO SB RAS organized more than 60 conferences on different scientific topics. Current symposium is the only one in Russia where fundamental problems of propagation in inhomogeneous media and the scattering and absorption radiation are considered. Very few conferences in the world have such a spectrum of interest. It is very attractive for participants from former 16 countries that the official languages of symposium are Russian and English.

In the field listed here, the Siberian scientific schools are leaders in our country and well known in the world. This fact can be attributed to the interest in symposium from the scientists of Russian Federation and other countries of the former.

Present: The Twenty-first International Symposium "Atmospheric and Ocean Optics: Atmospheric Physics" was successfully held in Tomsk, Russian Federation, 22–26 June 2015.

The program of the symposium included 12 invited and plenary papers, 193 oral presentations, and more than 180 poster presentations during four poster sessions.

Gennadii G. Matvienko Oleg A. Romanovskii