

Preface

The aerosol, being a natural constituent of the atmosphere, plays an important role in formation of its optical state. At present there is a vast material compiled on the microphysical and optical properties of aerosol, as well as on the processes of its generation and transformation in the atmosphere at, practically, all heights where it contributes to the optical properties of the atmosphere.

At the same time, strong variability of the aerosol properties in space and time, together with the connections of these properties with the atmospheric properties makes the study of aerosol in a more detail an urgent problem. Such studies are very important when aimed at revealing the role of aerosol particles in the processes leading to climate change as well as of their effect on geo- and biospherical processes. The information that may be obtained from the aerosol studies can also be useful in refining the models of optical properties of the atmosphere necessary for making calculations in the radiative transfer problems and estimating the efficiency of the optical systems intended for operation through the atmosphere.

The increasing aerosol overburden of the atmosphere by anthropogenic aerosols also makes the aerosol studies especially important in connection with the global impact on the Earth's atmosphere that may show negative effect on climate.

The progress in the development of numerical models of the general circulation of the atmosphere that has undoubtedly been achieved in recent years (with the radiation blocks being their major part) also causes the necessity of gaining new knowledge on the basic optical properties of aerosol which, at present, can be obtained only experimentally. It is quite understandable that despite of how perfect and reliable the numerical and analytical methods used in the radiative transfer problems are, the success in forecasting the climate changes will finally be determined by the reliability of data on optical properties of aerosol and on the correctness of the way their variability under the influence of atmospheric factors is allowed for. Thus, in particular, a correct account of the aerosol optical properties and their trends, especially with the account of anthropogenic sources of aerosol, could show compensation for the warming that is being forecasted due to the effect of greenhouse gases.

It was already for the fifth time when Tomsk hosted the traditional workshop on atmospheric aerosol with the participation of researchers involved in the aerosol studies that was held at the Institute of Atmospheric Optics. From year to year the scope of studies presented at the workshop extends, and friendly and collaborative contacts among the participants grow in number. Although the meeting is traditionally called Siberian Aerosols the range of problems discussed and geography of studies presented by the participants has already far exceeded Siberian region.

When preparing this workshop, we were greatly concerned that during that tough time the research community will lose the interest in joint studies. Fortunately, this has not happened! Moreover, the growth of research efforts keeps on. More than 120 reports have been presented at the workshop this time what is the record number.

Assessing the state of the present day aerosol studies in Siberian region, it is worth noting the following aspects: there is observed an increasing interest in measurements of chemical composition of aerosol substance; certain progress has been achieved in studying the nucleus fraction of aerosol; a significant number of presentations devoted to modeling the air pollution transfer in the atmosphere are based on the data of field experiments. The workshop has also demonstrated that a well coordinated research of many aspects of the processes governing the formation of aerosol weather over Siberian region is being carried out by many research groups.

It is my pleasure to note that this time a larger number of presentations at the workshop reported on the results of joint studies and field missions. All this convincingly shows that our working group became a real coordination center of the research in this field that is often desirable, having in mind poor funding of science in our country, to increase the efficiency of using the unique intellectual potential of the whole country.

I also would like to express our special gratitude to Dr. Paul Schippnick and Dr. Lyudmila Shamanaeva who translated and edited the papers of this issue.

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