

## PREFACE

This topical issue of the journal, we offer to our readers, is composed of the papers devoted to the spectroscopic studies which, for a long time or even traditionally, are related to atmospheric optics.

The first group of papers (from the first to the eighth) clearly demonstrates the circumstance that investigations into the particularly atmospheric processes and problems preassume that quite serious studies of such specifically spectroscopic problems as the absorption line shape and its connections with the inter- and intramolecular interactions, as well as of the influence of these interactions on the molecular absorption spectrum itself, are needed. Very good illustration of the above said is the problem on the absorption line center shift because, from the one hand, this not very essential, as it could appear, effect quite noticeably influences on the applicability of certain spectroscopic techniques to atmospheric optics studies, and, on the other hand, calculations of the line shifts and especially its measurements are not so simple spectroscopic tasks. It is important to underline here that at present there is an urgent need for transforming a vast spectroscopic (calculational and experimental) material into new versions of the spectroscopic databases that are more convenient for users.

The other group of papers (ninth to eleventh) convincingly shows that good understanding and proper application of spectroscopic effects to laser sounding of the atmosphere is quite necessary condition of success in such studies. This aspect becomes especially decisive when the problem arises on seeking most efficient ways of solving the inverse problems.

The paper, which completes this topical issue can be considered as a good presentation of a class of physical problems concerning the propagation of electromagnetic waves where the absorption effects play nontrivial and, moreover, sometimes a decisive role, that cannot be reduced in description to introduction of simple Bouguer exponential factors into the final formulas.

Dr. S.D. Tvorogov, editor