Preface

The book is based on the special courses "Introduction to the asymptotic methods" and "Asymptotic method in mechanics" for postgraduate students at St. Petersburg State University and first read by Prof. P.E. Tovstik more than 40 years ago. The authors would like to underline the special role of Prof. P.E. Tovstik, who initiated the study of asymptotic methods applied to problems of solid mechanics at Saint-Petersburg (then Leningrad) State University and who is a teacher of the contributors.

The present book is a result of the scientific cooperation of researchers from the Departments of Theoretical and Applied Mechanics of the Faculty of Mathematics and Mechanics of St. Petersburg State University and the Department of Mathematics of the University of Ottawa.

Since in most of the papers in the collection on mechanics of solids published in 1993 [10] asymptotic ideas and methods were used the publisher proposed to supply the volume with survey by S.M. Bauer, S.B. Filippov, A.L. Smirnov, and P.E. Tovstik entitled "Asymptotic Methods in Mechanics with Applications to Thin Shells and Plate." Later this survey encouraged the authors to write a textbook on the application of the asymptotic method in mechanics. The present book is the elaborated version of the Russian edition published in 2007. The book is supplied with the Introduction containing a brief discussion of publications on asymptotic methods in mechanics of solids, especially those that are not referred to in the main text. The reference section is significantly enlarged.

The authors believe that studying the basics of asymptotic methods may be useful to advanced undergraduate, postgraduate, and Ph.D. students in Mathematics, Physics, and Engineering, to researchers and engineers working in the analysis and construction of thin-walled structures and continuous media, and to applied mathematicians who are interested in asymptotic methods in problems of mechanics.

This work was supported in part by the Russian Foundation for Basic Research through Grants #13-01-00523-a and #15-01-06311-a.

The authors are thankful to master's and Ph.D. students of the Department of Theoretical and Applied Mechanics of St. Petersburg State University for their dedicated help in reducing the number of errors in the solutions of the exercises.

Svetlana M. Bauer
Sergei B. Filippov
Andrei L. Smirnov
Petr E. Tovstik
Rémi Vaillancourt

http://www.springer.com/978-3-319-18310-7

Asymptotic methods in mechanics of solids

Bauer, S.M.; Filippov, S.B.; Smirnov, A.L.; Tovstik, P.E.;
Vaillancourt, R.

2015, XXI, 325 p. 88 illus., Hardcover
ISBN: 978-3-319-18310-7
A product of Birkhäuser Basel