

Antonio Schettino

Quantitative Plate Tectonics

Physics of the Earth - Plate Kinematics - Geodynamics

This textbook on plate tectonics is designed for students in geology and geophysics to acquire in-depth knowledge of quantitative methods in plate kinematics and dynamics. *Quantitative Plate Tectonics* can also be used as a reference book by geoscientists who desire to expand their knowledge beyond their own specialization, or by oil-and-gas professionals and ore deposit specialists that need to investigate the geodynamic context of formation of geologic resources.

Finally, this book can be considered as a comprehensive monograph on plate tectonics, which addresses the different quantitative aspects of this broad discipline, which has been traditionally partitioned into separate or quasi-separate branches.

Additional material, available at <http://extras.springer.com>, includes two computer programs for the analysis of marine magnetic anomalies and for plate kinematic modelling, as well as some important geophysical data sets and models. Solutions to the exercises are also included.

- A unified quantitative description of plate tectonics, combining geological and geophysical perspectives
- Professional software, manual verification examples and applications are available as additional material
- Includes detailed calculations, examples, and problem sets per chapter
- Well illustrated

Dr. Schettino has produced a book covering in a rigorous way the kinematics and dynamics of plate tectonics. The fundamental physics governing geodynamic processes are discussed quantitatively, the relevant equations are clearly derived, and the implications of results are illustrated with examples and problems. The book will repay careful reading not only by postgraduate students in geophysics and geology, but also by any Earth scientist who wishes to acquire a quantitative understanding of plate tectonics.

Giorgio Ranalli, Distinguished Research Professor, Department of Earth Sciences, Carleton University, Ottawa, Canada (author of "Rheology of the Earth", two editions, 1987 and 1995)

This text gives an excellent quantitative presentation of the kinematics and the dynamics of plate tectonics that integrates many aspects of the Earth sciences and provides a powerful model of the dynamic behaviour of the Earth. The geological and geophysical processes involved in elucidating the theory are clearly illustrated through a perfectly balanced level of mathematical and physical concepts including derivation of the relevant equations, examples and problems. The book is intended for advanced undergraduates, graduate students and professional earth scientists requiring an overview of the essential processes of plate tectonics. **Marco Ligi, Senior Researcher, National Research Council of Italy, Istituto di Scienze Marine, Bologna, Italy**

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