Introduction to Numerical Geodynamic Modelling (Hardback)

By Taras Gerya

CAMBRIDGE UNIVERSITY PRESS, United Kingdom, 2010. Hardback. Book Condition: New. 248 x 180 mm. Language: English . Brand New Book. Numerical modelling of geodynamic processes was predominantly the domain of high-level mathematicians experienced in numerical and computational techniques. Now, for the first time, students and new researchers in the Earth Sciences can learn the basic theory and applications from a single, accessible reference text. Assuming only minimal prerequisite mathematical training (simple linear algebra and derivatives) the author provides a solid grounding in basic mathematical theory and techniques, including continuum mechanics and partial differential equations, before introducing key numerical and modelling methods. 8 well-documented, state-of-the-art visco-elasto-plastic, 2-D models are then presented, which allow robust modelling of key dynamic processes such as subduction, lithospheric extension, collision, slab break-off, intrusion emplacement, mantle convection and planetary core formation. Incorporating 47 practical exercises and 67 MATLAB examples (for which codes are available online at this textbook provides a user-friendly introduction for graduate courses or self-study, encouraging readers to experiment with geodynamic models.

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