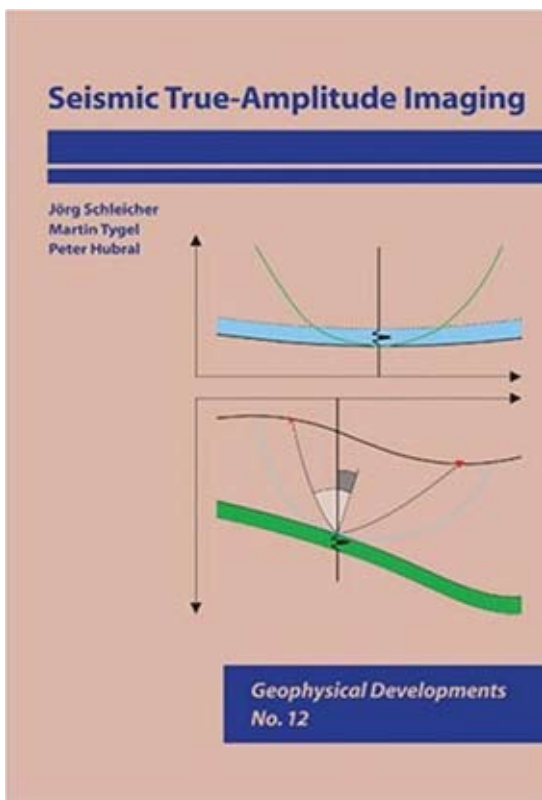


Seismic True-Amplitude Imaging

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Jörg Schleicher, Martin Tygel & Peter Hubral
 Schleicher, J.; Tygel, M.; Hubral, P. Seismic True-Amplitude Imaging. Geophysical Developments N°12. Tulsa: Society of Exploration Geophysicists, 2007. v. 1. 340 p. ISBN 1560801433

demigration (isochron) stack integrals. These two operators can be chained to create new methods to solve a very large class of target-oriented seismic-imaging problems, e.g., migration to zero-offset, configuration transformations, redatuming and remigration. Central to this unified approach is the concept of weighted stacks, where the weights are determined so that the geometric-spreading factors of primary reflections are adequately taken into consideration: True-amplitude imaging, as indicated in the title.

“Seismic True-Amplitude Imaging” is organized into nine chapters: Introduction, Description of the Problem, Zero-Order Ray Theory, Surface-to-Surface Paraxial Ray Theory, Duality, Kirchhoff-Helmholtz Theory, True-Amplitude Kirchhoff Migration, Further Aspects of Kirchhoff Migration, and Seismic Imaging. It also includes references, nine appendices, a list of symbols and abbreviations, and an index. At the end of every chapter there is a brief summary of the developed topics.

The book is written in a highly readable style and contains helpful figures to illustrate concepts throughout the text. The comprehensiveness of coverage regarding the basic principles of Kirchhoff-type imaging and its kinematic and dynamic aspects ensures the appeal of the book to academic and science audiences. It will make a great reference for the researcher and a source of interesting problems for the professor teaching a graduate course in seismic imaging.

The book provides a comprehensive presentation of Kirchhoff imaging theory, which deals with techniques for the determination of an image of subsurface reflectors from seismic reflections/diffractions. The text is based on the authors’ extensive academic experience on both seismic imaging algorithms and ray-theory methods.

In the first part of the book the authors develop the mathematical basics of zero-order ray theory, the fundamentals of paraxial ray theory, and some duality theorems relating the diffraction time and isochron surfaces. The second part is dedicated to presenting and exploring the unified approach to the seismic-reflection imaging problem: the Kirchhoff migration (diffraction) and