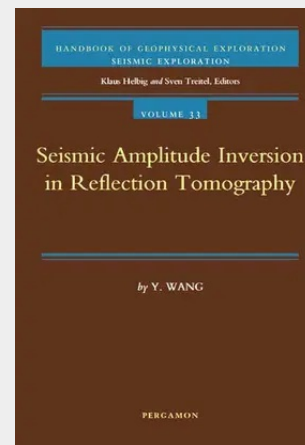


Seismic Amplitude Inversion in Reflection Tomography

This is the first book of its kind on seismic amplitude inversion in the context of reflection tomography. The aim of the monograph is to advocate the use of ray-amplitude data, separately or jointly with traveltimes data, in reflection seismic tomography. The emphasis of seismic exploration is on imaging techniques, so that seismic section can be interpreted directly as a geological section. In contrast it is perhaps ironic that, in decades of industrial seismology, one major aspect of waveform data that potentially is easier to measure and analyse has generally been ignored. That is, the information content of seismic amplitudes. Perhaps the potential complexity has deterred most researchers from a more thorough investigation of the practical use of seismic amplitude data. The author of this volume presents an authoritative and detailed study of amplitude data, as used in conjunction with traveltimes data, to provide better constraints on the variation of seismic wave speed in the subsurface. One of the fundamental problems in conventional reflection seismic tomography using only traveltimes data is the possible ambiguity between the velocity variation and the reflector depth. The inclusion of amplitude data in the inversion may help to resolve this problem because the amplitudes and traveltimes are sensitive to different features of the subsurface model, and thereby provide more accurate information about the subsurface structure and the velocity distribution. An essential goal of this monograph is to make the amplitude inversion method work with real reflection seismic data.



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