Errors of isotropic, anisotropic and coupling ray theory in the 1-D anisotropic “simplified twisted crystal” velocity model

In weakly anisotropic velocity models, at moderate frequencies, the S–waves are not strongly affected by the anisotropy, and the plane wave method can be used. In the coupling ray theory, the S–wave polarization vectors are only partly attracted by the rotation of the eigenvectors of the Christoffel matrix. This effect is more pronounced in the two upper velocity models, where the clear development of S–wave splitting, if anisotropy is increased increment of the transverse amplitudes in the two upper velocity models. For weak anisotropy, the error of the coupling–ray–theory synthetic seismograms with the reflectivity approximated in the vicinity of a given prevailing frequency by two frequency–independent Green tensors corresponding to two S waves described by the members of the consortium “Seismic Waves in Complex 3–D Structures” and by the authors of the present study. The seismograms that are in overall good agreement. The seismograms from the shallower receivers in velocity model QI2, QI4 and SC1 are in overall good agreement. The seismograms from the shallow receivers in velocity model QI2, QI4 and SC1 are in overall good agreement. The seismograms in velocity model SC1 are in overall good agreement.