Source & crustal propagation effects on *T*-wave envelopes

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There have been several studies about empirical relation between seismic source parameters (e.g., focal mechanisms, depths, magnitudes, etc.) and *T*-wave observation. In order to delineate the relation, numerical and theoretical approaches to figure out *T*-wave excitation mechanism are required. In an attempt to investigate source radiation and wave scattering effects in the oceanic crust on *T*-wave envelopes, we perform three-dimensional numerical modeling to synthesize *T*-wave envelopes. We first calculate seismic *P*- and *SV*-wave energy on the seafloor using the Direct Simulation Monte Carlo based on the Radiative Transfer Theory, which enables us to take into account both realistic seismic source parameters and wave scattering in heterogeneous media, and then estimate excited *T*-wave energy by normal mode computation. The numerical simulation has been carried out considering the following different conditions: source types (strike and normal faults), source depths (shallow and deep), and wave propagation through homogeneous and heterogeneous Earth media. From the results of numerical modeling, we confirmed that *T*-wave envelopes vary according to spatial seismic energy distributions on the seafloor for the various input parameters. Furthermore, the synthesized *T*-wave envelopes show directional patterns due to anisotropic source radiation, and the slope change of *T*-wave envelopes caused by focal depth. Seismic wave scattering in the oceanic crust is likely to control the shape of envelopes.