

Particle motion of S-wave coda in terms of energy partitioning (3)

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Recently, the nature of coda waves attracts much attention again in terms of the applicability of seismic interferometry. Nakahara (2007, 2008) investigated particle motion (energy partitioning) of S-wave coda from local earthquakes at three stations of the Kik-net in Tohoku District. He found that the energy partitioning is stabilized in S wave coda and it shows frequency dependence.

In this study, I try to explain the frequency dependence of the energy partitioning using horizontally layered structures. In modeling, P, SV, and SH plane waves with an equilibrated P- to S-wave energy ratio are assumed to be isotropically incident on a layered structure from a bottom half space. For layered media estimated from well logging, it is possible to explain the partitioning at the surface below about 6Hz but not for higher frequencies. So I conduct inversions for S-wave velocities and thicknesses using Genetic Algorithm. Then, good fit between observations and calculations is obtained by thickening lower-velocity layers at shallow depths. On the other hand, for the partitioning at subsurface, I can also fit the data. But the best-fit structure shows a high-velocity layer at a depth of about 50m, which contradicts with the best-fit model for the surface. So far, I have not yet obtained the best-fit model to explain the energy partitioning at the surface and subsurface simultaneously.

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