

Modeling of SKS splitting parameters measured in Japan with Hi-net

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To systematically investigate the spatial variation of seismic anisotropy around Japanese islands, we measured splitting parameters (fast polarization direction ϕ , delay time δt) of teleseismic SKS phases observed by Hi-net (Ogawa et al., 2014, SSJ). The results indicated regional scale variations of splitting parameters that are apparently related to subduction systems. In order to investigate detailed anisotropic structures (fabric in mantle wedge, subducting slab, and asthenosphere), we conducted forward modeling using synthetic seismograms. We modeled the SKS phases by the ray theory. We assumed that the SKS ray is straight and that each region has homogenous anisotropy. We rigorously calculated the phase velocity in each region by solving the Christoffel matrix. The preliminary analysis indicates that the measured splitting parameters appear to be primarily affected by the A-type fabric in subducting slab (oceanic lithosphere) whose a-axis aligns in the direction of the fast axis observed at the surface by using our OBS data.

Keywords: seismic anisotropy, s-wave splitting, modeling