Seismic anisotropy of uppermost mantle in the eastern Chugoku and Shikoku districts as estimated by receiver function analysis

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We calculate transverse component receiver functions by using 300 seismograms recorded at three seismic stations, Nariwa, Umaji and Mino, in F-net and Hi-net of National Research Institute for Earth Science and Disaster Prevention. The receiver functions are arranged in ascending order of back azimuth measured from the north. In the receiver functions, we identified P-to-S converted phases around 5 seconds after the first P arrival, irrespective of azimuth direction and epicentral distance. Amplitude of the converted phase periodically varies with increasing back azimuth. Period of the amplitude change versus back azimuth is 360 degrees. The periodic amplitude change is interpreted as being due to seismic anisotropy of the uppermost mantle and lower crust. In order to investigate anisotropic properties of the uppermost mantle and lower crust we apply weighting coefficient stacking technique (Girardin and Farra, 1998) to the receiver functions, assuming that the seismic anisotropy is hexagonal symmetry. The result shows that the hexagonal symmetry axis is oriented in the direction of NW-SE to N-S in the uppermost mantle under each station. This result is consistent with the fast propagation direction of P-wave azimuthal anisotropy in the Chugoku and Shikoku districts, which Ishise (2005) obtained by three dimensional inversion of first P arrival times from local earthquakes in southwest Japan.