

Spatiotemporal variation of the polarization anisotropy of S waves observed at the Nojima fault (3)

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We have analyzed S wave splitting using the aftershocks of the 1995 Hyogoken-Nanbu earthquake to detect the Spatiotemporal variation of the S waves anisotropy around the Nojima fault zone. Ito and Kuwahara(1996) deployed a temporal seismic array to observe aftershocks of the 1995 Kobe earthquake in the north part of the Nojima fault in Awaji island for about two weeks from February 14, 1995. The array was perpendicular to the Nojima fault at Nojima Hirabayashi, where maximum right-lateral slip of about 2 m was observed. The array observations with almost the same specifications have been being repeatedly carried out up to the present. The array consists of 12 or 16 velocity type 3-component seismometers. The total lengths of the array are about 200 m. Intervals of seismometer are ranging from 5 m to 30 m. It is noted that the soft sediments of the Osaka group are distributed in the west side of the Nojima fault, while the hard rock of granodiorite is distributed in the east side of the fault. The fault damaged zone is distributed in the center region of the array. For the S wave splitting analysis, we applied a cross-correlation method. The method was also applied to the fault zone trapped waves observed in the damaged zone.

The main results are described as follows:

- 1) S waveforms have different characters in three regions of the array, the soft sediments region of the Osaka group, the fault damaged zone, and the hard rock site of the granodiorite. The data should be analyzed individually for the three regions.
- 2) Most of the leading shear wave polarizations (LSPD) are not found to be changed from just after the Hyogoken- Nanbu earthquake up to the present, being in E-W direction which is parallel to the regional tectonic stress axis.
- 3) However, the LSPD's in the region of hard rock site for the data showing the trapped waves are found to be in NW-SE direction, perpendicular to the strike of the Nojima fault for period just after the earthquake. This suggests that the cracks perpendicular to the fault strike was open very near the fault zone after the earthquake. This result is consistent with the borehole logging data for the crack distribution shown by Kiguchi et al(1999).
- 4) The LSPD's has a tendency to be parallel to the fault strike for the trapped wave, even though the number of reliable data is not sufficient.
- 5) The cracks effective to the S wave anisotropy are mainly distributed rather in the shallow depths.