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Monitoring of the Nojima Fault structure using ACROSS

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To research the healing process of the Nojima Fault structure which ruptured in the 1995 Hyogo-ken Nanbu earthquake (Kobe earthquake, Mw 6.9), ACROSS was set near the boreholes by the Nojima Fault-zone Probe Project and has been operated intermittently since 2000 to monitor temporal variations of the fault structure. In this study, we investigate the long-term change in the travel time, the amplitude and the anisotropy of the transfer function propagating in the fault fracture zone. The result that the travel time variations in both P- and S-wave arrivals proceed about 2 ms since 2000 are consistent with a healing process of a fault. However, the amplitude does not show interpretable variation. As for the anisotropy, estimated from S-wave splitting, we found that the anisotropy is stable since 2000. The leading S-wave polarized direction (LSPD) in the shallow zone indicates that cracks in this zone are orientated to the strike of branch fault, not the direction of the regional horizontal compression (E-W). The degree of anisotropy in the deep zone is smaller than that in the shallow zone and the cracks in deep zone is close and/or not selectively orientated.

Keywords: ACROSS, monitoring, Nojima fault, S-wave splitting