

Signals from the Toki seismic ACROSS station observed by a temporal seismic line deployed in Tokai area

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A seismic line with 81 seismic stations (75 temporal and 6 fixed stations) was conducted in the Tokai area from the April to the August in 2008 (Kato et al., 2009). The seismic line was extended from Makinohara City, Shizuoka Prefecture to Toki City, Gifu Prefecture, where Toki seismic ACROSS transmitting station (JAEA) is located, on the focal region of the Tokai earthquake and deep low-frequency tremors.

Here we show observational results of seismic ACROSS signals transmitted from Toki station by the seismic line. During the observation period, the seismic ACROSS at Toki station has transmitted FM signal with a carrier frequency of 13.005Hz, modulation period 50s and 5.5 tonf in mean force. In frequency domain, this is "frequency comb" signal with 461 line spectrums, 0.02Hz interval and about 2700N in mean spectrum amplitude in the frequency range 10.245-19.445Hz. The rotational axis of an eccentric mass is set vertical so that the force of wave transmission is radial or transverse by linear combination of data recorded signals of rotation in opposite directions. Period of switching of rotational direction is 2 hours.

After stacking of 3 to 4 months data and routine data processing of ACROSS, 6-component tensor transfer functions or Green's functions were acquired for 81 seismic stations (6-component : rR, tR, zR, rT, tT, zT, where r:radial, t:transverse, z:vertical components excited by R:Radial and T: Transverse transmission). S/N ratios of the record sections are low as a whole, in consequence of not only noisy environment of observation stations and short stacking time period for low source power but also strong scattering structure under the seismic line by using high frequency wave. However, arrivals of P and S waves and later phases are recognized well up to about 100 km from Toki station because the seismic stations are dense. In record section of zR component, P phases with large apparent velocity at long distance could be reflection waves from deep crust.

Keywords: seismic ACROSS, Toki station, Tokai area, temporal seismic observation