Analysis of seismic ACROSS signal at Morimachi using seismic array installed in Tenryu-Funagira tunnel

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Seismic ACROSS transmitting station at Morimachi deployed MRI has been regulated by repeated test operations. Transfer functions have been obtained using Hi-net station data and P or S waves have been identified. Correlation of transfer function between near station was no so good, because of high frequency wave transmission. This brought us the difficulty of obtaining arrival direction using array analysis. More dense seismic station distribution is necessary to clarify the feature of wavelet. Estimation of appropriate distance for array analysis is important for future work. We deployed small seismic array in Western Shizuoka prefecture.

Seismic array was installed in the Funagira tunnel in Hamamatsu city. Distance from Morimachi ACROSS transmitting station is about 13 km. The tunnel expanded in NS-direction and linearity is good. Noise source near here is not so large except road above the northern part of the tunnel. We installed 4 velocity seismometer. Each distance is 1:3:2. The southern most seismometer has 3-components (FNAAR1) and others (FNAAR2 - FNAAR4) have only vertical component.

Low frequency transmission signal (3.5 - 7.5 Hz) was used in this analysis. The noise level of these stations was higher than that of Hi-net stations, but comparable to that of ground stations. The temporal variation of noise level showed high in day time and low in night time. The data were stacked with the weight of reversely proportional to the data variance. SN ratio for 20 days stacking was about 2. We calculated transfer function using stacking data for 45 days. Transfer function of FNAAR1 showed us the clear P and S phases. P phase was dominant in z-component and S phase was dominant in transverse-component. Comparing 4 transfer functions of vertical component, we found that the phase of first arrival was almost same, but the amplitude of later part was different.