

Relation between smallest microtremor amplitudes and largest seismic amplitudes observed at TRIES seismographic stations

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In 1999 TRIES, Tono Research Institute of Earthquake Science, started to establish an observation network of seismographic stations in Tono district, the eastern area of Gifu Prefecture, and completed a 10 stations network at the end of the year. The seismographic station TRIES was the first station, and 9 stations, TOGARI, ENA, MIZUNAMI, AKECHI, IWAMURA, NATAKI, MITAKE, TOKI and INUYAMA were established one by one. In order to investigate the correlation between the smallest spectral amplitudes of microseisms and largest seismic spectral amplitudes, we started spectral analysis of microtremors and seismic waves recorded on the same seismograms. By the discrete Fourier transform we calculated the spectral amplitudes and frequencies from the observed microtremors recorded just before the first arrival of seismic waves in the frequency range from 2.0 to 4.0 Hz. Similarly we calculated the spectral amplitudes and frequencies of seismic waves by the discrete Fourier transform in the frequency range from 2.0 to 4.0Hz. We calculated the ratios of the relative amplitudes of the smallest amplitude of microtremors and largest amplitude of seismic waves to those at the station TRIES. By taking the relative amplitudes of micro tremors and largest seismic amplitudes to those at TRIES we can extract the relative site effects caused by the ground soil to those at TRIES. Since the site effect at TRIES is small, the relative largest seismic amplitudes at TOGARI, for example to those at TRIES simply give multiples of the amplitude at TRIES, at each station. Preliminary results show that the smallest amplitude of microtremors will give the spectral amplitudes of the site effect that will amplify the incident seismic waves from the underlain basements.

Keywords: microtremor, seismic waves, discrete Fourier transform, ground soil, largest amplitude, site effect