

## Relation between spectral amplitudes of microtremors and maximum seismic amplitudes

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It is important for mitigation of the seismic hazards to investigate the frequency characteristics of oscillations caused by the shallow ground soil structure. If the peak of spectral amplitudes of microtremors is related definitely to that of seismic oscillations, microtremor observations will give us useful information about the spectral peak amplitude of seismic oscillations. Here we calculate the spectral amplitudes of the microtremors and two seismograms observed at three seismic stations at TRIES high density seismographic network by the discrete Fourier transform. The frequency range from 2 to 4Hz is especially important, since many two storied wooden houses are very popular in Japan. We divide the frequency range from 1.95 to 4.04 Hz into 21 intervals of 0.1Hz, decide the minimum spectral amplitudes from 20 or 30 microtremor data, and consider the minimum amplitudes as those under an imaginary quiet circumstances. The maximum spectral amplitude of seismograms is influenced by not only the site effect, but the magnitude, source mechanism, propagation path and so on. In order to avoid the factors except site effect, we use two relative microtremor minimum amplitudes and two relative seismic spectral ratios to those at TRIES, the reference point. Results obtained from the comparison of two earthquakes show nearly parallel distributions to spectral features which correspond to the differences of recorded amplitudes. The peak value frequency of the minimum amplitudes of microtremors will correspond with the characteristic oscillation frequency of the ground soil. This means that the microtremor spectral amplitudes will successfully be used to estimate the maximum spectral amplitudes of earthquakes in the future.

Keywords: microtremor, seismic wave, ground soil, discrete Fourier transform, maximum amplitude, seismic hazard