

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

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Seismographic stations of Tono Research Institute of Earthquake Science (TRIES) cover the Tono district in Gifu Prefecture since 1999. The station TRIES was the first station, and stations MIZUNAMI, INUYAMA, and others were established one after another. In order to investigate any relevancy between amplitudes of microseisms and maximum seismic spectral amplitudes, we started the data analysis of microtremors and seismographic data. By the discrete Fourier transform we calculated the spectral amplitudes and frequencies from the mainpart of the seismographs in the frequency range from 2.0 to 4.0 Hz. On the other hand we calculated the spectral amplitudes and frequencies of microtremors by the discrete Fourier transform at the intervals of 0.1Hz from 2.0 to 4.0Hz. We consider that the minimum amplitudes of microtremors in the small intervals of 0.1Hz represent the most quietest environment. Dividing the maximum amplitudes and minimum amplitudes at INUYAMA station by those at the referent station TRIES we get the information about the site effect at INUYAMA as normalized by the amplitudes at TRIES. The results indicate that the frequency of the maximum seismic amplitude corresponds to the frequency of rather small microtremor amplitudes. The comparisons of the maximum and minimum amplitudes on the site effects show such a clear tendency that the maximum spectral amplitude clearly relates to the small amplitudes of microtremors. This supports our presumption of the relevancy of the maximum seismic amplitudes to the minimum microtremor amplitudes.

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