

High-cut filter characteristics of ground motions from crustal earthquakes occurring in Northern Miyagi prefecture

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High-cut frequency characteristics of ground motions for the 2003 Miyagi-Ken Hokubu earthquake and its aftershocks are examined. It is very important to clear spectral decay characteristics in high frequency range for strong ground motion prediction.

The Butterworth type high-cut filter with cut-off frequency, f_{max} and its power coefficient of high-frequency decay are assumed to express the high-cut frequency characteristics of ground motions in this study. The four parameters such as seismic moment, corner frequency, f_{max} , and its power coefficient are estimated by comparing observed spectra at hard rock sites with theoretical spectra. The theoretical spectra are calculated, based on the omega squared source characteristics convolved with propagation-path effects and f_{max} filter shapes.

In result, the f_{max} of the mainshock of the 2003 Miyagi-ken Hokubu Earthquake is estimated as 8.3Hz. The f_{max} 's of the aftershocks are estimated in the range about 14Hz and 20Hz. The f_{max} 's of the mainshocks tend to be smaller than those of the aftershocks. The seismic moment dependency of the f_{max} 's, however, is not clear.