

High-cut filter characteristics of ground motions from the 2007 Niigata-ken Chuetsu-oki Earthquake

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High frequency cut-off characteristics of ground motions from the 2007 Niigata-ken chuetsu-oki earthquake are examined. It is very important to clarify spectral decay characteristics of strong ground motion in high frequency range for engineering purposes.

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, s , 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 high-cut filter shapes.

In result, the f_{max} of the mainshock of the 2007 Niigata-ken Chuetsu-oki Earthquake is estimated as 5.5Hz and the power coefficient, s , is estimated as 1.24, respectively. They agree well with the values derived from ground motions of past crustal earthquakes.