

Study on spectral decay characteristics in high frequency range of observed records during The 2016 Kumamoto Earthquakes

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Spectral decay characteristics of ground motions for the 2016 Kumamoto earthquakes are examined. In this study, spectral decay characteristics in high frequency range are evaluated by two approaches. One is f_{\max} filter, the other is spectral decay parameter, κ (Kappa).

In result, f_{\max} 's of large earthquakes are estimated to be 7Hz to 10Hz and the larger earthquakes are, the smaller f_{\max} 's tend to be. The power coefficient of f_{\max} filter, s , of largest foreshock and mainshock of the 2016 Kumamoto Earthquake are larger than those of large earthquakes occurred in other region. From this result, a region dependency of spectral decay characteristic is suggested.

κ 's of large earthquakes are estimated to be 0.0466 to 0.0482. There are positive correlation between s as power coefficient of high-frequency decay of f_{\max} filter and κ as spectral decay parameter and between f_{\max} for the f_{\max} filter and f_E for parameter κ . f_E is a frequency at which spectrum starts to decrease on log-linear scale. f_E is a very important parameter for strong ground motion prediction, however f_E has not been examined carefully enough in previous κ studies. It is confirmed that evaluated high frequency characteristics by f_{\max} filter and those from spectral decay parameter, κ agree well with each other.

Keywords: The 2016 Kumamoto Earthquakes, Spectral decay characteristics, fmax filter, Kappa