



Characteristic of high-frequency attenuation parameter from the downhole array in Taipei Basin, Taiwan

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In this study, we calculate the high-frequency attenuation parameter κ , proposed by Anderson and Hough (1984), based on the seismograms recorded by stations, which installed in the Taipei basin. The time windows applied to seismograms are suggested to be shear waves that are transformed to spectrum by the Fourier transform technique. When frequency is greater than a specific frequency, the spectral amplitudes decay exponentially with frequency, which can be described as $A(f) = A_0 e^{-\pi \kappa f}$, where $A(f)$ is the spectral amplitude, and A_0 depends on the earthquake source and epicenter distance, f is the frequency, and the value of κ is independent of frequency, unit in second. The seismograms from the downhole array in Taipei Basin by Academia Sinica since 1992, provide a good opportunity to estimate the attenuation factor of the strata beneath the Taipei basin. The seismograms of 23 earthquakes with magnitude ranges of 5.1-7.1 over the period of 2003-2010 at 9 downhole array stations are taken into calculation of the κ values for the shear waves. The results show that the κ values vary with depth. The variation of κ can reach a maximum of 0.03 sec and a minimum of 0.002 sec can be used in the technique of stochastic prediction of ground motion.