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Estimation on peak ground acceleration by Q-structutes

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Seismic Q is a dimensionless quantity which measures the amount of energy dissipated per radian as seismic waves propagate. Seismic Q varies with the composition of the material and its physical condition. The amount of seismic energy received in building strictly depends on the anelasticity of the media that the seismic wave traveling through. Therefore, the seismic attenuation factor of the subsurface material is the parameters for estimating the displacement near the ground. In this study, we use the new high-quality data recorded by CWBSN and TSMIP to inverse the detailed Q-structures in Taiwan area. The theoretic maximum amplitudes of the ground acceleration in Taiwan area for 30 events have been calculated by using the attenuation equation and the Q-structures. The deviation between these estimated amplitude and the maximum amplitudes of these events observed at stations of CWBSN are obtained. The results show that most of the deviation is small than 30%. It indicates that we can predict the maximum amplitude of ground acceleration for any events occurred in Taiwan area under the accuracy of 70 % (probability).