

Seismic Attenuation under the Eastern Central Mountain Range of Taiwan

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Earthquakes occur frequently in Taiwan because of its location in the collision zone between the Eurasian and Philippine Sea plates. Seismicity is high in eastern Taiwan and moderate in western Taiwan. However, in between there is an apparent aseismic zone under the eastern Central Mountain Range. In order to find out possible causes of this remarkable phenomenon a linear seismic array has been deployed across southern Taiwan by the Institute of Earth Sciences, Academia Sinica in Taiwan since April 2005. Data from this seismic array are used to study seismic attenuation under the eastern Central Mountain Range. In total there are 25 stations in the linear seismic array. Each station is instrumented with a continuous digital recorder (Q330) and a broadband sensor (Trillium). Seismic data for 168 events with M_L larger than 3.5 from April 2005 to July 2006 are analyzed in this study. We obtained the Fourier amplitude spectra of P and S waves within time windows picked by the P and S wave arrival times, respectively. Seismic attenuation is obtained from the observed spectra based on the Brune source model. We first determined the t^* by comparing the observed to the calculated spectra. The t^* data of P and S waves at all 25 stations are then compared to examine its lateral variations across the eastern Central Mountain Range. Furthermore, the Q^{-1} is obtained by inversion of the t^* in this study. Finally, possible implications of seismic attenuation under the eastern Central Mountain Range are discussed.