

Lg waveforms recorded by EarthScope's Transportable Array (TA) are used to estimate Lg attenuation (crustal averaged attenuation) in the western United States. In particular, Lg attenuation is determined using filtered Lg spectral amplitudes. These amplitudes are filtered at several bandwidths in order to determine the frequency dependence of Q. The two-station and reverse two-station techniques are used to calculate the Q values. We used data from 292 events occurring from 2005 to 2010 and ranging from magnitude 4 to magnitude 6. The relative site responses, which can be used to improve hazard estimates, are also determined. These site responses can be determined using the reverse two-station method. These site responses are relevant input parameters in ground motion prediction equations. A positive correlation between high heat flow, recent tectonic activity, strain rate and Q is observed. Areas with low heat flow, thin sediment cover, and no recent tectonic activity are observed to have consistently high Q. Our new Lg attenuation models provide a comparison with previous studies and better constrain regions with high crustal attenuation. These new attenuation constraints and site response values will help to improve the overall understanding of the structure and assemblage of western North America. The tomography maps generated can be used to inform the public about which regions of the western United States are stable and which are tectonically active. These maps can also be used to demonstrate which areas of the western U.S. have a higher seismic hazard.

