

Long-period ground motion before earthquakes

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Broadband seismometers are generally utilized to continuously monitor ground motion. When continuous ground motion data retrieved from seismometers were examined, amplitudes in a frequency band between 5×10^{-5} Hz and 5×10^{-4} Hz were significantly enhanced about 6-10 days before three example M6 earthquakes (i.e., 2016 Meinong earthquake in Taiwan, 2010 Baja California earthquake in Mexico and 2004 Parkfield earthquake in California). We computed propagation directions of ground motion by using maximum horizontal amplitudes and found that intersection areas determined using these directions from entire seismic stations are close to epicenters. Analytical results suggest that ground motion with long-period characteristics is excited from areas of forthcoming earthquakes. Long-period ground motion would be sources of other pre-earthquake anomalous phenomena and could be utilized to expose causal mechanisms.

Keywords: Ground motion, Pre-earthquake anomalous phenomena, Broadband seismometers