Geophysical Research Abstracts
Vol. 19, EGU2017-4064, 2017
EGU General Assembly 2017

The development of a rotational magnitude scale

Bryant Chow (1), Andrea Simonelli (1), Celine Hadziiannou (1,2), Stefanie Donner (1), and Heiner Igel (1)

(1) Department of Earth and Environmental Sciences, LMU Munich, Germany, (2) Institute of Geophysics, University of Hamburg, Germany

Current surface wave magnitude equations normally take into account only the vertical component of peak ground displacement, and therefore only contributions from Rayleigh waves. Horizontal components contain both Rayleigh and Love waves, which potentially obscure attenuation characteristics. With the advent of rotational ground motion observations from instruments such as ring laser gyroscopes and fibre-optic gyroscopes, it is now possible to determine peak amplitudes of rotations about the vertical axis. At teleseismic distances, these are dominated by Love waves and are in principle unaffected by Rayleigh waves. We aim to use this concept to determine a Love wave based surface wave magnitude equation; with a large database of rotational ground motion events of varying source parameters, we intend to empirically define a rotational magnitude scale and consequently an amplitude decay law for Love waves.