Geophysical Research Abstracts
Vol. 19, EGU2017-10909, 2017
EGU General Assembly 2017

Seismic hazard assessment over time: Modelling earthquakes in Taiwan

Chung-Han Chan (1), Yu Wang (1), Yu-Ju Wang (2), and Ya-Ting Lee (3)

(1) Nanyang Technological University, Earth Observatory of Singapore, Singapore, Singapore (chchan@ntu.edu.sg), (2) Institute of Nuclear Energy Research, Atomic Energy Council, Executive Yuan, Taiwan, (3) Department of Earth Sciences, National Central University, Taiwan

To assess the seismic hazard with temporal change in Taiwan, we develop a new approach, combining both the Brownian Passage Time (BPT) model and the Coulomb stress change, and implement the seismogenic source parameters by the Taiwan Earthquake Model (TEM). The BPT model was adopted to describe the rupture recurrence intervals of the specific fault sources, together with the time elapsed since the last fault-rupture to derive their long-term rupture probability. We also evaluate the short-term seismicity rate change based on the static Coulomb stress interaction between seismogenic sources. By considering above time-dependent factors, our new combined model suggests an increased long-term seismic hazard in the vicinity of active faults along the western Coastal Plain and the Longitudinal Valley, where active faults have short recurrence intervals and long elapsed time since their last ruptures, and/or short-term elevated hazard levels right after the occurrence of large earthquakes due to the stress triggering effect. The stress enhanced by the February 6th, 2016, Meinong M_L 6.6 earthquake also significantly increased rupture probabilities of several neighbouring seismogenic sources in Southwestern Taiwan and raised hazard level in the near future. Our approach draws on the advantage of incorporating long- and short-term models, to provide time-dependent earthquake probability constraints. Our time-dependent model considers more detailed information than any other published models. It thus offers decision-makers and public officials an adequate basis for rapid evaluations of and response to future emergency scenarios such as victim relocation and sheltering.