



Ground Motions Induced by Precipitation and Fluvial Processes: An Example from Taiwan

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Ground motions can be induced by weather-related processes. Analyzing such signals might help quantify those natural processes. Here, we used continuous seismic, meteorological and stream data to analyze broadband ground motions during heavy precipitation events in Taiwan. We detected long period seismic signals in drainage basins during two meteorological cases: Typhoon Morakot in 2009 and East Asian rainy season in 2012. The amplitudes of the seismic waveform correlate well with the amount of the precipitation and the derivative of water level and discharge in a nearby river. We proposed that these seismic signals were induced by ground tilt induced by the loading from the increased water volume in the nearby river. Furthermore, we used the seismic data to estimate and quantify the strength of precipitation during such events. The seismically derived precipitation correlates well with the observed meteorological data. It shows that the long period seismic data may be used to monitor rainfall in real-time. Next, we will try to test our tilt hypothesis using other independent datasets.