

Toward a near real-time shaking map using the P-alert seismic network in Taiwan

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Shaking maps are one of the useful information for hazard assessment after earthquakes occurred. Based on dense and real-time seismic network the detailed and fast shaking maps are available. The Central Weather Bureau of Taiwan (CWB) has operated two strong motion seismic networks. One is the real-time strong motion seismic network, named RTD, consisting of 110 stations. It can provide a shaking map within 15 minutes after an earthquake occurred. The other is the dense seismic network named Taiwan Strong Motion Instrument Project (TSMIP) consisting of more than 800 stations. However, the shaking map generated by the RTD seismic network cannot reveal actual ground motions due to poor station density. The TSMIP seismic network cannot transmit data in real time. Recently, the low-cost Micro-Electro Mechanical System (MEMS) accelerometers has been deployed in Taiwan, named P-alert seismic network, with about 609 stations transmitting data to the center in real time. The P-alert seismic network provides an opportunity to provide quick and real shaking map, but the ground motion records from the P-alert need to be corrected because all P-alert sensors deployed on the wall or pillar of buildings. To obtain real ground motion without building influence, we proposed an approach using TSMIP records to construct a transfer function for the P-alert records. Finally, once an earthquake occurred using the real-time P-alert data streams and corrected by the transfer function, the real ground-motion shaking maps become available.

Keywords: seismic network, shaking map, low-cost seismometer

