



## **The travel-time sequence method for rapid earthquake locating in Taiwan**

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Taiwan is constantly threatened by large and damage earthquakes as the tectonic consequence of the persistent collisions between the Philippine Sea Plate and Eurasian plate. Nowadays, the earthquake early warning (EEW) system is one of the practical tool for seismic hazard mitigation, and has been developed in Taiwan for almost 20 years (Wu et al., 1997; Wu et al., 2000). The earthquake location for the EEW purpose in Taiwan is based on the traditional method with 1-D velocity structure but using less stations. In this study, we developed a new EEW locating method using 3-D velocity structure and pre-calculated travel time database.

The seismic network used in this study is the Rapid Earthquake Information Release System (RTD; Wu et al., 1997; Wu et al., 2000) operated by the Central Weather Bureau, Taiwan. We divided the Taiwan area (119~123 [U+FF9F] E, 21~26 [U+FF9F] N) into 2×2 km grid and each grid point is assumed as the hypocenter with the constant focal depth of 10 km. Therefore, each grid point has its specific travel-time sequence of the RTD stations using the 3-D velocity model (Wu et al., 2009). When an earthquake occurs, we use the first ten station arrival sequence to compare with the travel-time sequence database, and define the least difference grid as the hypocenter. By using the travel-time sequence method, we can rapidly determine the earthquake location more accurate than the present method in Taiwan