

Application of the Real-Time Seismic Wavefield on the Earthquake Early Warning System

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The earthquake early warning system (EEWS) operates by analyzing real-time seismic data. Following data processing and parameter estimation, the EEWS can issue warnings to areas at risk. Initially, a limited number of stations were used, leading to uncertainties in estimations. The EEWS functions in two modes: point source and wave field. In the point source mode, P-wave data is used to estimate origin time, epicenter, depth, and magnitude, with predicted intensities based on ground motion equations. In the wave field mode, real-time seismic intensities create a predictive wave field for the next second. Challenges arise with mega earthquakes (typically magnitude 7 or greater) and intense aftershocks. Main shock magnitudes may be underestimated due to factors like finite fault effects. Aftershock warnings might be missed if P-waves are hard to detect. False alarms can occur when two small earthquakes happen close together, leading to mistaken associations and overestimation of magnitudes and intensities. This study aims to use the wave field concept to address these issues and reduce processing time.

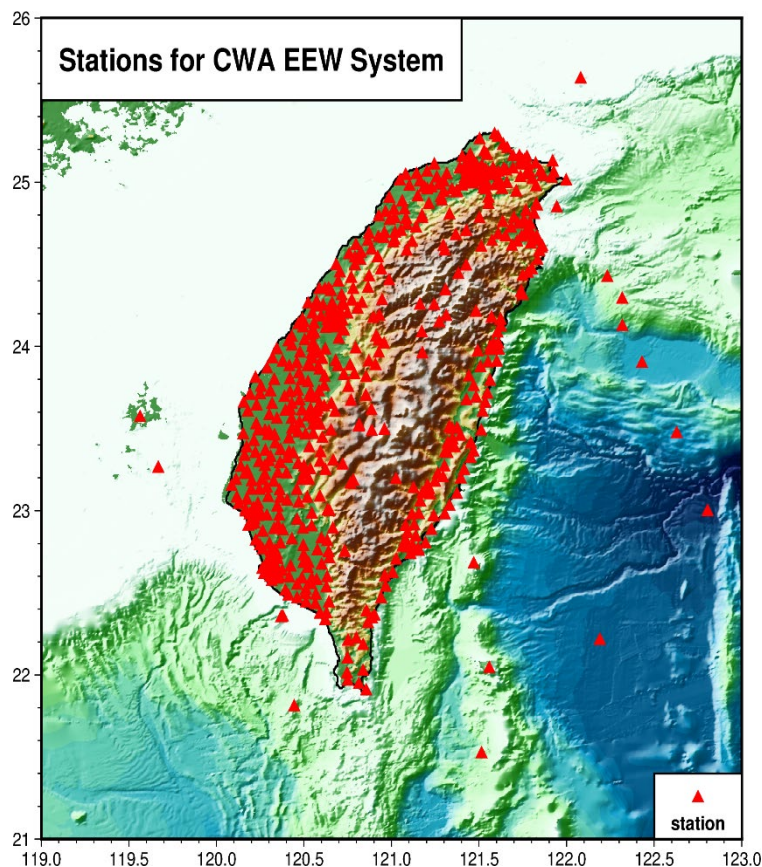


Figure 1. Real-time seismic network of CWA.