

Performance of On-site Earthquake Early Warning Systems for Different Sensor Locations

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Abstract : Regional earthquake early warning (EEW) systems are not suitable for Taiwan, as most destructive seismic hazards arise due to in-land earthquakes. These likely cause the lead-time provided by regional EEW systems before a destructive earthquake wave arrives to become null. On the other hand, an on-site EEW system can provide more lead-time at a region closer to an epicenter, since only seismic information of the target site is required. Instead of leveraging the information of several stations, the on-site system extracts some P-wave features from the first few seconds of vertical ground acceleration of a single station and performs a prediction of the oncoming earthquake intensity at the same station according to these features. Since seismometers could be triggered by non-earthquake events such as a passing of a truck or other human activities, to reduce the likelihood of false alarms, a seismometer was installed at three different locations on the same site and the performance of the EEW system for these three sensor locations were discussed. The results show that the location on the ground of the first floor of a school building maybe a good choice, since the false alarms could be reduced and the cost for installation and maintenance is the lowest.

Keywords : earthquake early warning, on-site, seismometer location, support vector machine

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