

## Characteristics of PGA prediction for station corrected on-site EEWs in Taiwan

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There were wide developments on the application of earthquake early warning system (EEW) recent years for accomplishing disaster prevention issue for large earthquakes. Most of the peak ground acceleration (PGA) predictions for EEW were calculated from ground motion prediction equation (GMPE) for rock condition or linear relation between amplitude of initial P-wave (Pd) and PGA but prediction errors were usually still significant due to lack of site effect consideration. Meanwhile, traditional EEW system could divide into two major approaches including regional warning and onsite warning system. The latter one was the main purpose, including  $\tau c$ -Pd method (method 1) and the Pd method (method 2) were used for this study.

Earthquake database used in this study were recorded from Taiwan strong motion instrumentation program (TSMIP) with magnitude larger than five and time period was from 1993 to 2014. The abovementioned two methods were discussed for ability of PGA prediction purpose in western Taiwan region. For  $\tau c$ -Pd method, NCREE model (Hsu, 2015) used in this study was using additional station correction for traditional EEW parameters Pd and  $\tau c$  to firstly improve the accuracy of magnitude and hypocenter distance estimation. Second, site corrected GMPE would be applied for PGA prediction to get precisely ground motion estimation. In contrary, for Pd method, the linear relation of Pd and PGA were constructed for individual stations and site corrections were applied for two separated regions including whole Taiwan (ALL model) and regional ones. Preliminary results indicated site correction for both methods could effectively reduce prediction errors and different scale of regional models could give several stages in situ that how many historical records for target station. Finally, several characteristics of PGA prediction for station corrected on-site were found including there was different linear relation for method 2 in near field events and far field events, method 2 could provide more accurate PGA prediction than method 1 but method 1 could also provide source information, site conditions could be a preliminary index for selection of alternative regression coefficient from nearby stations for those stations who didn't have much records to calculate site correction for method 2.

Keywords: site-corrected PGA, on-site earthquake early warning system, Taiwan