Improve the PGA estimation by the station corrected for earthquake early warning system in Taiwan

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In recent years, there has been a wide development on the application of earthquake early warning system (EEW). But the accuracy, effected by the site still existed some estimated errors, has to be strengthen. In order to reduce the loss of life and property, improving the accuracy of EEW is important. If the error can be improved, accompanied with data information from the intense observation around Taiwan, the EEW can offer a better hazard prediction for different regions. The classification of EEW system is divided into two major approaches. One is the regional warning and the other is the onsite warning.

In this study, we use the earthquake event (with magnitude over five) which recorded by TSMIP from 1993 to 2014. For the regional EEW system, we perform NCREE model (Tsai et al. 2009) which Hsu proposed in 2015 by using parameter P_d and τ_c (Wu et al. 2005) and station correction to estimate magnitude and hypo-distance. Once we get the estimated magnitude and hypo-distance after station correction, we can more exactly estimate the PGA through the attenuation equation and its site correction function. In onsite EEW, this study estimates the PGA with two kinds of models. One is the model established with P_d and observed PGA of whole regions in Taiwan (ALL Model) and the other one is regional model established with regional P_d and PGA and we will substitute the P_d of each station into each models to get the estimated PGA. In order to improve estimated PGA, we perform the site correction after getting initially estimated PGA. This study will compare the regional difference with the PGA correction of NCREE Model and ALL Model.