Site correction of earthquake early warning system in Ilan, Taiwan

Chaio Chu Hus(1), Kuo Liang Wen(1)(2)
(1) Institute of Geophysics, National Central University, Taoyuan, Taiwan,
(2) National Center for Research on Earthquake Engineering, Taipei, Taiwan

Abstract

Earthquakes were not effectively predicted by us at present. Shallow earthquake has dangerous disaster to resulting loss of lives and properties. In order to reduce disaster occurred for earthquake, it is an effective way that earthquake early warning (EEW) system can be applied for strong motion early prediction. EEW provides alerts to urban areas of the forthcoming strong ground shaking. Depending on the specific geometry of the epicenter and the strong motion network used in EEW, the warning time can be a few seconds to tens of seconds. This warning time can be extremely important since even a few seconds can be sufficient for pre-programmed systems to have emergency response. In this study, in order to improve the accuracy of early warning. We explore two different correction methods. (a) Each station has site effect, so we want to reduce the impact of site effect. Let EEW method added correction items. (b) We found a linear relationship between the P_d and PGA. Use this regression equation to estimate PGA. According to two correction methods, we can improve the accuracy of PGA.

Reference

Jean, W.Y., Chang, Y.W., Wen, K.L., and Loh, C. H., 2006, Early estimation of seismic hazard for strong earthquakes in Taiwan, Nat. Hazards, 37, 39-53.

Kanamori, H., 2005, Real-time seismology and earthquake damage mitigation, Annual Reviews of Earth and Planetary Sciences, 33, 195-214.

Kou, C. H., Kuo, L. W., Hsieh, H. H. and Lin., C. M., 2012, Site classification and Vs30 estimation of free-field TSMIP stations using the logging data of EGDT.

Wen, K. L., Shin, T. C., Wu, Y, M., Hsiao, N. C. and Wu, B. R., 2009, Earthquake early warning technology progress in Taiwan, Journal of Disaster ResearchVol.4No.4.

Wu, Y. M., Teng, T. L., Shin, T. C. and Hsiao, N. C., 2003, Relationship between peak ground acceleration, peak ground velocity, and intensity in Taiwan, Bull. Seism.Soc. Am 93, 386-396.

Wu, Y. M. and Kanamori, H., 2005a, Experiment on onsite early warning method for the Taiwan early warning system, Bull. Seism. Soc. Am 95, 347-353.

Wu, Y. M., and Kanamori, H., 2005b, Rapid assessment of damage potential of earthquakes in Taiwan from the beginning of P Waves, Bull. Seism. Soc. Am 95,1181-1185.

Wu, Y. M., Yen, H. Y., Zhao, L., Huang, B. S. and Liang, W. T., 2006, Magnitude determination using initial P waves: A single-station approach, Geophys. Res. Lett., 33, L05306, doi:10.1029/2005GL025395.

蔡克銓，林沛暘，林子剛，林主潔，林詠彬，林瑞良，翁元滔，張道明，沈哲平，鐘展聲，2009，強震即時警報系統資訊加值分析先期研究，國家地震工程研究中心，報告編號，NCREE-09-013。