

Early prediction of peak ground acceleration considering site effect parameters

*Ting Yu Hsu¹

1. Assistant Professor

It is commonly seen that the destructive seismic wave is amplified owing to various site conditions and leads to unforeseen seismic loss. Researchers have shown that site parameters such as the average shear-wave velocity of the upper 30 meters of sediments (V_{s30}), the Horizontal to Vertical Spectral Ratio (H/V Spectral Ratio, HVSr), and the dominant frequency corresponding to HVSr, are able to address the characteristics of different sites. Therefore, this paper accommodated these site parameters together with P-wave features to estimate the possible peak ground acceleration (PGA) by the use of artificial neural network (ANN) algorithm. The input P-wave features of ANN were calculated from the first 3-second interval of a P-wave signal, and the performances of ANN models with and without site parameters were investigated and discussed. It is found that the proposed ANN model with HVSr parameters effectively reduced the error between estimated PGA and measured PGA when compared with the ANN model without site parameters.

Keywords: Site Effect, Peak Ground Acceleration, Horizontal to Vertical Spectral Ratio