Shallow S-wave velocity structure of Pingtung Plain, Taiwan derived from HVSR simulation

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Pingtung plain in the south of Taiwan is covered with soft sedimentary strata. Seismic waves will be amplified after propagating through these strata and leads to serious disaster. For Taiwan, a country located in an active plate boundary, it's essential to clarify the site effect there. To know the ground response, correct and detailed shallow velocity structure is necessary. Although there are several studies provided some velocity structure, their scales are all too large to provide enough information. In this study, microtremor horizontal-to-vertical spectral ratio (HVSR) of 308 sites were simulated to inverse the shallow velocity structure of Pingtung Plain in detail. In our simulation, Haskell method had been used to calculate the theoretical HVSR of corresponding S wave velocity structure and combined with Genetic Algorithm to search for the best structure. After the S-wave velocity structure was brought out, we used the one-dimensional equivalent-linear method to simulate the surface waveform of 2016 M_w 6.5 Meinong earthquake from bedrock record. By comparing the simulated surface record with the observed surface record, we could validate the derived S-wave velocity structure of the Pingtung plain.