S-Wave Velocity Structure of Taipei Basin by Using the Simulation of Microtremor H/V Ratios

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In this report here the investigation of the S-wave velocity structures of the Taipei basin which is located in the northern Taiwan. Previous study, the dense microtremor measurement analysis have been confirmed in Taipei Basin. However, within the basin around the layer effects on seismic site characterization and contribution have still needed to clarify more details, as the strata in Taipei basin with reference to estimate ground motion prediction. The detail site response all over the Taipei basin has been studied by using the H/V ratios of dense microtremor surveys. In this study, a method, GA-Haskell, combining Genetic Algorithm and Thomson–Haskell propagator matrix was used to simulate the microtremor H/V ratios according to the previous results of dense microtremor surveys. The near-surface S-wave velocity structures of over 400 sites in the Taipei basin were evaluated by the simulations of the H/V ratios. Through the numerous microtremor data are helpful to figure the S-wave velocity and thickness of the Sungshan Formation and the other deeper formations which control the seismic site-effect in the basin. While many strong motion stations have also been performed microtremor measurement and single station spectrum to understand the earthquake site characteristics analysis. Compared with other research results, confirmed the applicability of the method for estimating the velocity structure in Taipei Basin. Finally, accord with the actual site earthquake and microtremor response, established a complete and detailed S-wave velocity model of the Taipei basin. It will benefit the strong motion prediction and simulation in the future.

Key Words: Taipei Basin, Microtremor, H/V Ratio, S-wave Velocity, Site Effect