SSS26-P23   Room:Convention Hall   Time:May 20 17:15-18:30

Modeling 3-D subsurface structure for strong ground motion estimation the in Tottori plain

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   This study was performed for the purpose of constructing 3-D subsurface structure model for strong ground motion estimation in the Tottori plain. First, previously proposed layered structure models were integrated into an averaged layered structure model. Thickness of each layer was estimated at microtremor array observation site through the inversion analysis with from observed phase velocity data with the layered structure models. Distributions of layer boundary depths were estimated from the results and gravity survey data. 2-D 3rd-order B-spine function was adopted for modeling boundary depth distribution. Strong ground motions due to the 1943 Tottori earthquake (M7.2) was simulated by the 3-D finite difference method. The 3-D subsurface structure model was well verified by comparing the distribution of peak ground velocity with the damage distribution under the 1943 Tottori earthquake.

Keywords: strong ground motion, 3-D finite difference method, Tottori plain, 3-D subsurface structure