

Estimation of bedrock depth by receiver function using strong motion data in the Kyoto basin

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We estimated R/V receiver functions of P waveforms of local earthquakes observed at strong motion stations in the Kyoto basin. Assuming a peak time of observed R/V receiver functions corresponds to the difference in arrival time between the direct P wave and the P-to-S converted wave (PS-P time) generated at the sediment/bedrock boundary in the Kyoto basin, we got the basin depth. The present Kyoto basin velocity model (Kyoto Prof., 2006) agreed with the obtained bedrock depth at most stations except several stations located near the basin edge. We modified the bedrock depth beneath each station. For validating that the peak time is corresponding to the PS-P time, we calculated theoretical R/V receiver functions using the discrete wavenumber method (Bouchon, 1981) with a double-couple point source in laterally homogeneous modified velocity model. Theoretical R/V receiver functions using the modified model showed good agreement to the observed R/V receiver functions.

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