Effect of Interaction between Bedrock and Surface Layer on the Predominant Period of Surface Layer

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A study was conducted to understand the effect of engineering bedrock on the predominant period of surface layer. The results confirmed that even when the natural period T_g derived from eigenvalue analysis is the same, the interaction with engineering bedrock can cause significant changes in the predominant period and ground motion. Additionally, it was clarified that the influence of engineering bedrock is likely to shorten the predominant period compared to T_g when the natural periods of the first and second modes from eigenvalue analysis are relatively close or when the shear stiffness of the surface layer is relatively large. We have proposed a method to easily correct this tendency, and have confirmed that it can estimate the dominant period of the ground more accurately. It is expected that the insights obtained in this study will improve the accuracy with which the predominant period of ground during earthquakes can be estimated, and enable ground motion to be evaluated while taking into account the uncertainty of the predominant period.