

Preliminary study to estimate elastic impedance in ground surface layer

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Dynamic response of structures during earthquakes depends on physical parameters in the ground due to the dynamic soil-structure interaction. The influence is complicated, but it is known that elastic impedance of ground layer associates with the radiation damping.

Normalized Energy Density (NED; Goto et al., 2011a) is a physical quantity related to wave propagation in multi-layered ground, and it becomes a constant value through each layer independent of how layer structure is. This characteristic enables us to directly estimate damping property of the layered ground when we observe NED in ground surface layer and NED in ground equivalent to the basement even we do not know concrete velocity structures of the layered ground (Goto et al., 2011b). NED is the function of elastic impedance in each layer. This means that it is necessary to measure the impedance in ground surface layer in order to calculate NED in ground surface layer.

In this study, we perform preliminary study by numerical experiment using finite difference method in order to consider a method of measuring elastic impedance in ground surface layer.

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