On the modeling technique of underground structure for strong ground motion prediction in case of lacking seismic data

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Modeling underground structure and the simulation of seismic wave fields in the media play very important roles for strong ground motion prediction as well as   parameterization of physical properties of the focal region does.   However, there still remain many tasks to be overcome that have not come to satisfactory solutions for drawing strong-motion maps, such as how should be the realistic 3-dimensional modeling techniques of the underground structure, how should be the realistic simulation techniques of seismic wave fields, etc.

Particularly, the modeling techniques of deep-ground structure, which is defined and bounded by two surfaces of seismic bedrock and engineering bedrock, typically at depths from a few hundreds meters down to several thousands meters, contain various difficult problems from a view point of the standardization of the method.   Such difficulties occur due mainly to the lack of existing data (especially, the lack of seismic refraction and/or reflection data) so far conducted over the specific site of interest.   Accordingly, the modeling methodology of constructing a 3-dimensional deep-ground structure must be chosen site-by-site based on the amount of the existing seismic data, which is unlike the standard way from a viewpoint of nationwide manner.

In the course of the National strong-motion mapping project of Japan, the authors clarify the present conditions of modeling techniques of the deep-ground structure as possible, and make a proposal on discussing the way to reach the standard strategy for constructing the realistic 3-dimensional model for strong ground motion prediction.