

Broadband ground motion waveform synthesis utilizing AI-based upsampling technique

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A method of synthesizing broadband ground motion by adding short-period components to long-period ground motion based on the relationship between long-period and short-period ground motion waveforms extracted from observation records has been proposed (Iwaki and Fujiwara, 2013). In this study, based on the idea of synthesizing short-period components from long-period component, we applied the relationship between the long-period and broadband ground motion waveforms to the artificial intelligence (AI) by using many strong motion data recorded by strong motion networks such as K-NET and KiK-net.

The problem of predicting broadband ground motion from long-period ground motion can be regarded as a problem of upsampling; predicting missing short-period components and synthesizing high-sampling data from low-sampling data lacking short-period component. In this study, we apply the coupled learning method which is one of the machine-learning methods to this problem. We will report the result of the basic study to perform broadband ground motion waveform synthesis.

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