Construction Method of Design Earthquake Motion Considering of Much Reference Earthquake Motion and Structural Nonlinear Response

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A calculation method of design earthquake motion which constructs appropriate structural nonlinear response from much reference earthquake motion was proposed. In the method, the waveform that mostly matching the target nonlinear response spectrum is evaluated by convoluting the wavelet coefficients of reference earthquake motions. The proposed method was applied to many waveforms. As a result, an appropriate waveform was synthesized in consideration of the natural period of the bridge, nonlinear response and the deformation of the ground structure. By using the proposed method, seismic design of various type of structures in the same region are carried out by using a unique design motion.