Evaluation of Earthquake Ground Motion Equipped with Probability of its Occurrence Based on the Seismic Hazard Analysis

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A bunch of earthquake ground motions that are expected to take place in a certain area together with probability of their occurrence are required in order to evaluate the seismic risk of railway structures and vehicles. In this study, we proposed the calculation method for obtaining a set of earthquake time histories and those occurrence probabilities by combining the seismic hazard analysis and strong motion estimation. In addition, we estimated the damage probability of hypothetical structures in the Tokyo region as an illustrative example of the proposed method. Finally, we have confirmed that a seismic risk of railway structures and vehicles is evaluated by using the proposed method.