



Considering both aleatory variability and epistemic variability in probabilistic seismic hazard analysis

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In the modern probabilistic seismic hazard analysis (PSHA), a standard deviation (σ) of total variability was considered in the integration for seismic exceeding rate, and this lead to increased seismic hazard estimates. Epistemic uncertainty results from incomplete knowledge of the earthquake process and has nothing to do with neither the temporal variation nor the spatial variation of ground motions. It is not could be considered in the integration, epistemic variability may be included in the logic trees.

This study uses Taiwan data as example to test a case in Taipei. Results reveal that if only the aleatory variability is considered in the integration, the hazard level could be reduced about 33% at the 475-year return period, and it reduced about 36% and 50% at 10000-year and 100000-year, respectively. However, if epistemic variability is considered in the logic trees besides the aleatory variability is considered in the integration, then the hazard level is similar to that from using total variability; it shows only a little bit smaller at long return period. Much effort in reducing the hazard level to a reasonable value still remains to be studied.