

Comparison of Probabilistic Seismic Hazard Maps for Various Time Origin

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1. Introduction

It is important to understand the probabilistic seismic hazard map [1],[2] to use the map widely. In this paper, probabilistic seismic hazard maps are evaluated for time period of 30 years starting from 1890, 1920, 1950, 1980, 2010 and 2040, respectively. These maps for various time origins are compared.

2. Method

Probabilistic seismic hazard maps are evaluated by the method of national seismic hazard maps for Japan. These maps indicate the possibility of strong shaking within 30 years at every location on the map. The probabilities of occurrence before and after the earthquake are evaluated due to past earthquakes. For example, as past earthquakes of the Philippine Sea Plate, the Kanto earthquake in 1923, the Tonankai earthquake in 1944, and the Nankai earthquake in 1946 have occurred. The Miyagi-ken-Oki Earthquake in 1978, the Tokachi-Oki earthquake in 1952 and 2003 have occurred as past earthquakes of the Pacific Ocean Plate.

3. Results

Two kind of maps are evaluated. One is the map of the probability of seismic intensity equal to or larger than 6 Lower (exceeding instrumental seismic intensity 5.5) in 30 years from a time origin, and another is the map of the seismic intensity for a fixed probability of exceedance in 30 years from a time origin. These maps are shown according to the seismic category. The following is shown by comparing these maps. The seismic hazard is greatly changed according to whether the earthquake occurs for the seismic category I earthquakes (large inter-plate earthquakes) [3]. Even if the time origin is variable, the seismic hazard is not so changed in the Japanese whole country, though the hazard in a part of region is changed according to whether the earthquake occurs for the seismic category III earthquakes (earthquakes in upper crust). It is important to compare these map with the distribution of maximum seismic intensity by the earthquakes for each 30-year period.

Reference

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