Strong ground motion prediction during the Nankai and Tonankai Earthquake by hybrid method.

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INTRODUCTION

In this paper, the strong ground motions in Osaka prefecture are predicted in case that the Nankai and Tonankai Earthquake simultaneously and in case of individual events. The Nankai and Tonankai Earthquake occur about 100 years interval, and generate heavy damage to wide area. Probabilities of the next earthquakes within 30 and 50 years in the future are announced by the Headquarters for Earthquake Research Promotion. Moreover, the result of the strong ground motion prediction and estimation of damages due to these earthquakes are published by the Central Council for Disaster Prevention. Potential interest of next Nankai and Tonankai Earthquake is arising with background of such political trend.

OUTLINE OF ANALYSIS

The hybrid method is adopted on a simulation to obtained reliable strong ground motions in wide frequency range. The long period ground motions are calculated by finite difference method considering three-dimensional structure of the Osaka basin and the Philippine Sea Plate which sinks down beneath the Eurasian Plate. The fault plain which has three-dimensionally curved surface is divided into four segments and modeled with flat fault plains. The outer and inner fault parameters are given according to the estimation by Central Council for Disaster Prevention. The rupture starting point is set at the boundary of Nankai and Tonankai Earthequake fault according to the location decided by Central Council for Disaster Prevention. Target sites of the analysis are set at the observation sites of CEORKA and K-NET in Osaka prefecture. Site amplification spectra at target sites were obtained by an empirical method using observed records.

RESULT

Remarkable results are obtained due to large fault plain and the deep basin structure.

1. Duration time of simulated waves are estimated very long, over 300seconds.
2. Long period component of seismic wave, over 1 second, is predominant.

Especially, peak ground velocity at east part of Osaka prefecture, where deep alluvium layer spread, is estimated over 70cm/sec in case that both earthquakes occur simultaneously. Distribution of seismic intensity in JMA (Japan Meteorological Agency) scale, which is calculated from simulated waves, is almost same with that published by Central Council for Disaster Prevention. The intensities of ground motions in case of individual events are about 60 or 80 % of those in case of simultaneous occurrence.