

Long-Period Ground Motions from a Large Offshore Earthquake: The Case of the 2004 Off Kii-Peninsula Earthquake

Hiroe Miyake[1]; Kazuki Koketsu[1]

[1] Earthq. Res. Inst., Univ. Tokyo

The 2004 off Kii-peninsula earthquake excited long-period ground motions widely over the Honshu, Shikoku and Kyushu islands of Japan. The record section indicates two types of long-period motions by the basin surface waves, either by the source or passage effect of the shallow and large offshore earthquake. Their combination resulted in the well-developed long-period ground motions observed within the distant basins as that during the 1985 Michoacan and 2003 Tokachi-oki earthquakes did. The distributions of pseudo-velocity response spectra confirmed this development at periods of 5-7 s in the Osaka and Nobi basins and of 7-10 s in the Kanto basin. The comparison of the distributions with the thicknesses of the sediments and the S-wave velocities of the surface layers shows that these characteristics of the long-period ground motions are closely related to the structures of the basins. The earthquake provided a timely warning of damaging long-period ground motions from future megathrust earthquakes in the Tonankai, Nankai and Tokai regions.