

Regional wave propagation from Noto Peninsula earthquake and development of long-period ground motion

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A large (Mj6.9) inland earthquake occurred in Noto Peninsula, central Japan on 25 March 2007. Strong ground motions caused by the earthquake displays large intensity (6+) above the source region and man felt area covers entirely in Tohoku to Central Japan. The extension of intensity in wide area is caused by efficient propagation of Lg waves produced by the shallow event, and attenuation properties of peak ground velocity and acceleration for the K-NET and KiK-net record shows anomaly large value in distance about 150km as compared with standard attenuation function of Japan.

Long period ground motion is also developed significantly in sedimentary basins such as Osaka, Nagoya and Tokyo although these basins are locating over 200-300km from epicenter. For example Tokyo was subjected by large and long-time duration of long-period ground motion at period of about 8s and duration extending over 4 min. Estimated velocity response spectrum in the center of Tokyo (TKY020) shows that maximum resonance of about 5cm/s occurred in the natural period of 8s, which is about 1/2 and 1/3 of that observed during the 2004 Chuetsu, Niigata earthquake (M6.8) and the 2004 SE Off-kii Peninsula (M7.4) earthquakes both cause some damage relating to the long-period ground motions in the center of Tokyo. The cause of such weak response during the 2007 Noto event may be due to strong attenuation of short and long-period ground motions as the wave propagating though Hida and Kiso Mountains.