

Attenuation characteristics of strong ground motions in Chugoku, Shikoku and Kyushu districts

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I investigated attenuation characteristics of strong motions using data of K-NET and KiK-net in the southwest Japan. First, I evaluated relative site factors of 630 sites of K-NET and KiK-net in the area using adjacent sites network method[Ikeura and Kato,2011]. Secondly I converted spectra observed at those sites during large earthquakes to ones of base rock motions by cancelling site amplification effect using the relative site factor of each site. The converted high frequency amplitudes from the 2000 Western Tottori earthquake clearly show linear attenuation curves in the distance range of 10 to 500km. The converted amplitudes of the 2001 Geiyo earthquake, which occurred at the depth of 46 km in Philippine sea plate, also shows almost linear distribution in the distance range of 50 to 400km. In contrast with these events, the converted amplitudes of the 2014 Iyonada earthquake, which occurred at the depth of 78 km in Philippine sea plate, showed widely dispersed distribution, indicating complex attenuation characteristics due to tectonic setting beneath these area. Lower limit of the wide distribution is characterized by western sites beyond volcanic zone in Kyushu district, while upper limit is characterized by eastern sites in the fore arc area of Chugoku district and in Shikoku district.

Keywords: strong motions, attenuation characteristics, site factor, southwest Japan