

Attenuation characteristics of high frequency strong motions due to inland earthquakes in the Pacific coast of Tohoku region

*Tomonori Ikeura¹

1. Kajima Technical Research Institute

In order to decrease errors of empirical strong motion prediction, the author studied detail attenuation characteristics of strong ground motions observed at K-NET and KiK-net sites in the Tohoku and Kanto regions during events occurred in Hamadori region of Fukushima Prefecture and northern Ibaraki prefecture. Attenuation characteristics of strong motions from these events were investigated using base rock motion amplitudes converted from observed ones by cancelling site amplification effect using relative site factors. These relative site factors were evaluated by Ikeura and Tomozawa(2012) so as to satisfy all relative site factors between adjacent two sites in the K-NET and KiK-net observation networks in the region using least square method without attenuation functions. In this study, attenuation characteristics of high frequency strong motions due to the 23 March 2011 and 11 April 2011 Hamadori in Fukushima prefecture earthquakes and the 19 March 2011 and 28 December 2016 northern Ibaraki prefecture earthquakes, which epicenters were arranged almost in the N15E direction, were discussed based on amplitude distributions of converted base rock motions from these events with hypocentral distances. The distributions of the amplitudes of converted base rock motions at all sites showed clear attenuation curves for these all events. Results of investigations on distributions of the converted base rock motion amplitudes at the sites in the N15E direction from epicenter of each event were as follows: (1) Base rock motion amplitudes in the north region of epicenters were larger than in the south region, indicating source characteristics of northward stronger high-frequency radiations. (2) Attenuation of converted base rock motions in the direction of N15E showed quite weak Qs effect in the distances up to 100 - 150km from epicenters. (3) Steeper attenuation was observed in the distances over 150km in the south area of epicenters than in the north area.

Keywords: strong motions, inland earthquakes, attenuation characteristics