

## Attenuation relationship of peak ground acceleration estimated from K-net data

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We examined the attenuation relationship of peak ground acceleration using K-net earthquake ground motion data radiated from earthquake events above magnitude 4.5. We obtained two findings as follows. The first is that the deep earthquake events (more than 30 km in depth) along the Pacific coast between Kanto region and Hokkaido region generate several times larger peak acceleration than that predicted from the attenuation relationship by Fukushima and Tanaka (1990). The second is that the peak acceleration of these events depends not on fault type but on focal depth.

The K-net provides earthquake-ground-motion data homogeneous in space and quality and allows comparisons for various aspects conveniently. Comparing the attenuation relationship of peak acceleration by Fukushima and Tanaka (1990) with the attenuation relationship obtained from K-net data of earthquake events of above magnitude 4.5, we found that there are two groups in the attenuation relationship. The first group is explainable by the attenuation relationship by Fukushima and Tanaka, and the second group is several times larger than predicted by Fukushima and Tanaka. We investigated location of the second-group earthquake events and the dependency of the second-group attenuation relationship on the focal depth and the fault type.

### 2) Location

We mapped the locations of the second-group events. They distribute along off-coast of the Pacific Ocean between Kanto region and Hokkaido region and their depth is more than 30 km.

### 3) Dependency on the focal depth and the fault type

We divided the earthquake events of the second group into subgroups in terms of magnitude (interval of 0.3), focal depth, and fault type. Comparison between the subgroups of the same magnitude shows that the attenuation relationship clearly depends on the focal depth. We furthermore divided these subgroups in terms of the fault type. Comparison between the subgroups of the same magnitude and focal depth showed that the attenuation relationship hardly depends on the focal depth.

### 4) Summary

We examined the attenuation relationship of peak ground acceleration using K-net earthquake ground motion data radiated from earthquake events above magnitude 4.5. We obtained two findings as follows. The first is that the deep earthquake events (more than 30 km in depth) along the Pacific coast between Kanto region and Hokkaido region generate several times larger peak acceleration than that predicted from the attenuation relationship by Fukushima and Tanaka (1990). The second is that the peak acceleration of these events depends not on fault type but on focal depth.