

Ground motion attenuation and site amplification around Aomori Prefecture

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As ground motion is a convolution of source, path and site effect, it has regional characteristics. Now a day, since we have many strong motion seismometer sites, such as K-net, KIK-net and Shindo-Joho network, studying regional ground motion characteristics is possible.

In Aomori Prefecture, we deploy 69 Shindo-Joho network stations. There are 29 K-net stations but 19 stations are shared by Shindo-Joho network. For the KIK-net, there are 18 stations. The PGA and seismic intensity from two events that occurred east off Aomori Prefecture are used in this study. Regression analyses are carried out for these indices by distance. For the PGA, we compare the result with the study of Fukushima and Tanaka (1992), while for the seismic intensity we employ the result of Shabestari and Yamazaki (1997) study for comparison. We can point out followings. A coefficient for distance of our study is larger than others. In close distance,

observed values are larger than estimated value while observed values are smaller than estimated one in far distance. Regression curve for borehole data is parallel to the regression curve established from surface data. The

difference of regression curve is assumable as site amplification factor. As we take account the volcanic front, coefficients for distance of this study are almost the same to the previous studies.

Next we study an amplification of surface records from borehole data of KIK-net. At first we try to evaluate the site the amplification factor by geological conditions quantitatively but so far it is impossible from literature. Then we adopt average S-wave velocity for top surface layer as the index. Since soil profiles of Shindo-Joho network station are not available, we just use the K-net and KIK-net site in this study. There are good correlations between amplifications of PGA and seismic intensity and average S-wave velocity for top 10 and 15 meters. When average S-wave velocity is 200 m/s, amplification factor is about five by our study. This factor is almost three times larger than Midorikawa et al. (1992). This shows that though reference site condition is different, site amplification in Aomori is larger than previous study.