## The high-frequency wave generation for the intra-plate earthquakes in the Philippine sea plate

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One of the properties of intra-plate earthquakes is that the high-frequency level is higher than that of the inter-plate earthquakes. The high-frequency wave generation for the intermediate-depth earthquakes in and around Hokkaido and Tohoku district is estimated from the source spectra by Ikeda et al. (2002a, 2002b). In those report, it is indicated that (1) the stress drop of the intra-plate earthquakes in and around Hokkaido and Tohoku district is higher than that of the inter-plate earthquakes, (2) the stress drop of the small intra-plate earthquakes (M5-6, 'small group') show variation and that of large one (M6-7.8, 'large group') is close to the upper limit of small one, and (3) the stress drop of the intra-plate earthquakes in Hokkaido is close to that of Tohoku district. The stress drop of the 2001 Geiyo earthquake estimated by Ikeda et al. (2002c) is close to that in and around Hokkaido and Tohoku district.

In this report, generation of the high-frequency wave of the intra-plate earthquakes in the Philippine sea is estimated and compared with that of Geiyo earthquake in the Philippine sea and the intra-plate earthquakes in and around Hokkaido and Tohoku district in Pacific plate.

The eleven intra-plate earthquakes of which JMA magnitudes are 5.1 to 6.8 are estimated. The accelerograms are observed at the surface station of the port and harbor research institute (PHRI) and KiK-net.

It is assumed that the high-frequency level of the acceleration source spectrum is constant (omega square model), and the decrease of the acceleration Fourier spectra is caused by the Q-value in propagation. The Q-values are estimated by slope of the decrease of the acceleration Fourier spectra. The correlation factor of Q-value and hypocentral distance is estimated and is applied to every observation record for the correction. MHF is defined as high-frequency level of acceleration source spectrum. For KiK-net record, MHF is defined as 'average level + sigma' of acceleration source spectrum in 1 to 5Hz. For PHRI record, M'HF is defined as 'average level + 1sigma' of acceleration source spectrum including the site effect in 1 to 10Hz. The site effect of the PHRI record is defined as the ratio of M'HF and MHF which is estimated for the same earthquakes. When KiK-net records are available, MHF are estimated from KiK-net records. When KiK-net records are not available, MHF are estimated from PHRI records by eliminating the site effect.

The MHF estimated in this report are compared with those of Geiyo earthquake and the intra-plate earthquakes in and around Hokkaido and Tohoku district. The stress drops of the small earthquakes (MJ5.1-6.0) show variation. This phenomenon can be found in 'small group' in Hokkaido and Tohoku. The stress drops of the large earthquakes (MJ6.2-6.8) including the Geiyo earthquake are close to the upper level of the small intra-plate-earthquakes as 'large group' in and around Hokkaido and Tohoku.

Generation of high-frequency wave of the intra-plate earthquakes in the Philippine sea plate is close to those in the Pacific plate in Hokkaido and Tohoku district.

Reference : Ikeda et al. (2002a), J. Structural and Construction Eng. (AIJ), No.560, 67-73 (in Japanese); Ikeda et al. (2002b), Abstracts of Annual Meeting SSJ in Autumn, A14 (in Japanese); Ikeda et al. (2002c), the 11th Japan Earthquake Engineering Symposium, 24, CD-ROM (in Japanese)