

The effect to spacial distribution of the strong motion amplification by the deep irregular basement layer surface

Yasushi Ishihara[1], Kazuki Koketsu[2], Masanori Saito[3]

[1] Sci, Yokohama City Univ, [2] Earthq. Res. Inst., Univ. Tokyo, [3] Faculty of Sci., Yokohama City Univ.

<http://www.seis.yokohama-cu.ac.jp>

The amplification of strong motion is affected by the irregular basement surface. After 1995 South Hyogo-ken earthquake, the survey of subsurface structure in plain region is progressed. The surface of basement locates at deeper depth in south Kanto region. Yokohama city survey report says that the depth is greater than 2.5km and varies until about 5km. In this research, the effect to strong motion amplitude by the deep surface of basement layer is evaluated by the 3D computer simulation.

The calculation is performed by the voxel FEM (Koketsu et al., 2001). The 3D structure is converted to grid model whose interval is 200 or 400m. The whole size of this model is 40km(NS), 40km(EW) and 11km(UD). The source wave is inputted from the bottom interface as plane waves oscillating to EW or NS direction. The waveforms are adopted by the Ricker wavelets having 1, 0.5 and 0.25 Hz of central frequencies.

The simulation results show an edge effect by the irregular interface between two sediment layers. The boundary zone of two layers amplified remarkably in the softer layer side. In case of deep surface of basement, the detailed structure survey in the sediments layer is very important. Secondary, in the softer sediments area, the spatial distribution of amplitude are predicted by the irregular basement layer. The differences of maximum amplitudes vary in about 3 times. Yokohama Strong Seismograph Network observed the amplitude variation about near-vertical incident S wave. The pattern of spatial distribution and maximum amplitude differences are similar between observed and calculated results. We will discuss detail factor of these variations using more real structure model.