

Site effects at strong motion stations in Shizuoka prefecture, Japan, and its application for validating the underground velocity model

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Estimation of site effect on ground motion is one of the fundamental issues for seismic hazard assessment. The spectral inversion method is applied to separate source, propagation-path, and site effects from strong motion data (e.g. Iwata and Irikura, 1988). In this study, we estimated site effects of strong motion observation stations in Shizuoka prefecture. We use totally 166 strong motion stations including K-NET, KiK-net and JMA, together with SMAD and Seismic intensity stations in Shizuoka prefecture from the SK-net. The number of events is 501, occurring in the period from March 1996 to July 2019, and the total number of event and station pairs is 8440. We assume the site effect of KiK-net SZOH24 is 2 for all frequency range. We also assume different Q-values of the propagation-paths in the Eastern and the Western areas with a border of the Itoigawa-Shizuoka Tectonic line. The obtained site effects of K-NET and KiK-net stations were compared to those by other studies and those were agreed well. One of the important usages of the obtained site effects is to discuss the basin velocity models, comparing those with theoretical amplification factors using subsurface velocity models in the study area, e.g., J-SHIS (Fujiwara et al., 2009, 2012), and the basin model by Wakai et al. (2019) for discussing the performance of these models.

Keywords: Spectral inversion, Site effects, SK-net, Strong motion data, Basin velocity model