

Estimation of underground structures in the Sendai plain and the Matsumoto basin by array measurements of microtremors

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S-wave velocity structures at three sites in the Sendai plain and at five sites in the Matsumoto basin were explored using microtremors. Microtremors were observed by three sets of arrays with radiuses of 100 to 1600 m in the Sendai plain and of 200 to 3200 m in the Matsumoto basin, which have a common center station, at each site. Phase velocities of the fundamental-mode Rayleigh waves in microtremors were measured by the spatial auto correlation method, and the phase velocities were inverted to explore S-wave velocity structures by the forking genetic algorithm. In the Sendai plain, the S-wave velocity of the basement is around 3.4 km/s. Depth of the sediment-basement interface with strong velocity contrast ranges from 600 to 940 m, which is obviously different between the northwest and southeast of the Nagamachi-Rifu fault. In the Matsumoto basin, shallow velocity structures vary along the Itoigawa-Shizuoka tectonic line. We could not estimate structures from large array measurements because of its weak correlation, which indicate inhomogeneity of underground structures of the Matsumoto basin.