Modeling of subsurface velocity structure from seismic bedrock to ground surface based on array microtremor observation in Aso area

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One of the important issues for improving the prediction of strong ground motion is to construct a ground model that can evaluate broadband ground motion characteristics. For that purpose, it is essential to integrate the shallow ground model and the deep ground model, which have been separately modeled, and to create a model that can reproduce the observation records. In this study, the K-NET, KiK We collected seismic records at seismic stations such as -net, the Japan Meteorological Agency, and local governments, as well as array surveys and records of single points (H / V spectral ratios) using many microtremors. In addition, the S-wave velocity structure model was examined from the analysis results as a basic study for constructing the ground model of the Aso area. In this report, we report the results of microtremor array observations and the results of the study on the construction of an integrated shallow and deep ground model.
In this study, an initial geological model was created, and the distribution of AVS30 (m/s) and an integrated shallow / deep ground model were constructed using microtremor array survey and microtremor measurement results. The distribution of the AVS30 and the engineering-based equivalent layer based on the ground model created in the Aso region this time is harmonious with the existing drilling data, similar to the results of research conducted in the Kanto and Tokai regions. ing. The theoretical H/V (periodic characteristics) and amplification characteristics calculated from the S-wave velocity structure model calculated in this study were also confirmed to be in harmony with the seismic records. The results show that the evaluation of phase velocities and periodic characteristics (H / V spectral ratios) per se by microtremor observations is very effective in improving the accuracy of the model, and is very effective for engineering platforms (for example, S-wave velocities such as Vs350). When it is difficult to set the depth of the upper surface of the structure, it is considered to be very useful as a method of correcting the engineering base depth based on geological and geological information using micro array microtremor observation. In the future, we plan to examine various amplification factor indices in comparison with the method using micro-topography and earthquake records, which are used as the ground amplification factor.

Keywords: Subsurface velocity structure, Microtremors, Strong Ground Motion, Array observation

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