Consideration of microtremor array observation results in Kumamoto area

*Shigeki Senna[1], Atsushi Wakai[1], Hiroyuki Fujiwara[1]

1. National Research Institute for Earth Science and Disaster Prevention

1. Introduction
In the NIED, in the area centered on the Kumamoto plain near the fault where the Kumamoto earthquake in the Kumamoto earthquake in the year of the Kumamoto earthquake occurred in the center, building the initial geological model by collecting the bowling data and collecting the microtremor observation and the seismic observation record S We have built a wave velocity structure model . In FY2007, we expanded the range of observation and modeling, and also carried out microtremor array survey in high density in northern Kumamoto and Aso areas. In this study, we investigated the S wave velocity structure model based on these data.

2. Microtremor array observation
Microtremor array observations were conducted at 16 large arrays (8 in the northern Kumamoto prefecture, 8 in the Aso area) and 600 in the miniature arrays for the northern Kumamoto prefecture and the Aso area. In the Aso area, a wide range of liquefaction and local ground deformation were also confirmed, so in order to elucidate the mechanism etc., it is carried out at 500 m intervals, which is double precision of 1 km interval in the past .

3. Analysis method of S wave velocity structure and outline of results
In this study, one-dimensional S wave velocity structure was evaluated by shallow ground survey method based on microtremor observation proposed / advanced in recent research . For the analysis of a very small array, H/V spectral ratio, phase velocity and S wave velocity structure were obtained using microtremor analysis software "BIDO2" and "cloud type microtremor observation system" . In the comparison and examination, we compared and examined the one-dimensional S wave velocity structure, the two-dimensional S wave velocity structure cross section and the depth plane distribution etc. with the initial geological model and the past geological structure data etc. As a result, in Aso area, confirmation of distribution of old lake bottom layer and structure related to graben etc. could be confirmed.

4. Summary
In this study, three dimensional S wave velocity structure distribution was created based on the analysis results obtained by seismic observation and microtremor observation in the northern part of Kumamoto Prefecture and the Aso region in addition to the result of last year. We have confirmed the relation with the ground deformation and liquefaction damage etc. at the time of the main shock of the Kumamoto earthquake because of the S wave velocity structure distribution and the dominant period distribution of the created ground model. In future, we will extend the range of the S wave velocity structure created last year and evaluate strong ground motion, and we will study the relationship with the damage caused by the earthquake.

Keywords: Strong motion evaluation, S-wave velocity structure model, Microtremor array, Borehole data

©2018. Japan Geoscience Union. All Right Reserved.