

Study on heterogeneous structure beneath the Beppu-Haneyama fault zone 2

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The Beppu-Haneyama fault zone is the active fault zone in Kyushu, running from the Beppu Bay to western part of Oita prefecture. In the Beppu-Haneyama area, there are many faults and some volcanoes exist between the fault zones. This suggests that the sub-surface structure is heterogeneous in this area. For example, the thin seismogenic layer (about 7km) and the seismic velocity anomaly. Here we developed a method for estimating the complex structure in the area. We modeled the structure of this fault zone as a structure composed by a background heterogeneity and strong scatterers.

We analyzed the 18 seismic events observed at 29 seismic stations deployed by Kyushu and Kyoto Universities, NIED and JMA. We estimated background structure by comparing the observed envelope with theoretical curve based on multiple scattering model. Then, the ripples in the observed envelope were extracted by comparing the envelope with the theoretically expected curve. We estimated the distribution of scatterers based on travel time of the ripples. At 4Hz, the strong scatterer located around the fault zone, the seismic velocity anomaly and the tectonic lines. At 8Hz, scatterer are distributed in the Kuju volcano area.

In conclusion, we could estimate the complex heterogeneity beneath the Beppu-Haneyama fault zone. This method can be applied to the heterogeneous structure of other area, and it is expected to image the structure.

Keywords: Beppu-Haneyama fault zone, Short wavelength heterogeneity