

極小微動アレイ解析による森本・富樫断層帯の2次元速度構造モデルの推定

The Estimation of 2D S-wave velocity structure model across the Morimoto-Togashi fault zone through miniature microtremor array analysis

*松本 なゆた¹、平松 良浩²、先名 重樹³

*Nayuta Matsumoto¹, Yoshihiro Hiramatsu², Shigeki Senna³

1. 金沢大学大学院自然科学研究科、2. 金沢大学理工研究域自然システム学系、3. 防災科学技術研究所

1. Graduate School of Natural Science and Technology, Kanazawa University, 2. Institute of Science and Engineering, Kanazawa University, 3. National Research Institute for Earth Science and Disaster Resilience

Around the Noto peninsula, ENE-WSW or NE-SW striking reverse faults developed under the E-W compression stress in Quaternary (Okamura, 2007). It is important to reveal the subsurface structures of the faults, which have formed the topography of this region, to understand the geotectonic history of this area.

The object of our study is to reveal subsurface structures of the Morimoto-Togashi fault zone, which is located in southern part of the peninsula. The probability of a large earthquake occurring within the next 30 years is high, 2-8%, and the fault passes the city center of Kanazawa. Therefore, this study is also useful for the disaster prevention. A seismic reflection survey around Togiya, the north part of the Morimoto fault, suggests that the fault structure is an east dipping reverse fault with 40-60 degree, (AIST, 2008). However, the details of the subsurface structures are still unknown. Additionally, the gravity anomaly analysis cannot detect the structural boundary along the fault. In this study, we conduct miniature array analysis (Cho et al., 2013) using miniature arrays with a radius of 0.6 m and irregular-shaped arrays with a radius of 5-15 m. Sampling frequency is 200 Hz and the observation duration is around 15 minutes. Seismometers used for the observation are JU410 manufactured by Hakusan Corporation. We set 11 lines across the fault zone. The intervals of the observation points are 100-200 m. We analyze data with the software BIDO and infer the two-dimensional S-wave velocity sections. The software BIDO combines a simple profiling method (e.g., Heukelom and Foster, 1960), where an S-wave velocity structure is calculated directly from a dispersion curve, and a simplified inversion method (Pelekis and Athanasopoulos, 2011) to estimate the S-wave velocity structure. Around Togiya where the seismic reflection survey was held, the obtained S-wave velocity section shows a discontinuous structure of bedrock ($V_s=500$ m/s) on the 100 m east side of the surface fault trace. This discontinuity infers the east dipping structure with a high angle, corresponding to the faulting type of the fault.

キーワード：常時微動、極小アレイ、不規則アレイ、速度構造、活断層

Keywords: microtremor, miniature array, irregular-shaped array, velocity structure, active fault