# 重力異常を用いた逆断層帯の解析

# The Analysis of the Active Reverse Fault Zones in Japan through Gravity Anomalies

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The Japanese islands are located in a subduction zone and they have undergone complex deformations as a consequence of regional stress changes. Therefore the active structures are diverse. The object of our study is to reveal distinctive features of active faults and to examine their spatial continuity through gravity anomalies. Seismic reflection survey is a major method to detect subsurface structure of faults, but seismic velocity structure is obtained only on linear profiles. Over 20,000 points of gravity data has been measured in Japan. Recently released high resolution data set enable us to detect detailed density differences in a wide area around faults. We analyzed 43 reverse fault zones in northeast Japan and northern part of southwest Japan among major active fault zones selected by Headquarters for Earthquake Research Promotion.
The gravity data published by GSI [2006], Yamamoto *et al.* [2011], and Geological Survey of Japan (AIST) [2013] and Kanazawa University data were compiled in this study. We applied terrain corrections using 10 m DEM and filtered data with a band pass filter in addition to normal correction procedures, then obtained the Bouguer anomalies.
Steep Bouguer gravity gradients are clearly observed along the faults at 21 faults zones, a weak correlation is recognized at 13 faults, and no correlation at 9 faults. We evaluate the continuity of the faults based on the continuity of maximum points of the horizontal first derivation and inflection points of vertical first derivation together with geological and topographical observations. We infer a faulting type and a direction of dipping from fault traces and the maximum isoline or the inflection isoline of the derivations.
For example, we recognize following features for the Itoigawa Shizuoka tectonic line. The fault end seems to extend at the northern end. A left stepping of the faults in the subsurface is revealed around Hakuba. The maximum isoline and the inflection isoline are distributed on the east of the fault rupture in the north and on the west in the south, indicating that the dip direction changes the east dipping to the west dipping from north to south.

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