

## Geologic structure across the central part of the western marginal faults of the Kitakami Lowland

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The western marginal faults of the Kitakami Lowland are active thrust faults, which develop along the eastern margin of the Ou Back-bone range. They have been believed to originate from normal faults caused by E-W extensional stress field during middle Miocene, and to activate as reverse faults under E-W compressional stress field since Pliocene. Though Kato et al. (2006) has shown normal inversion structures in the southern part of the faults, these structures have not been found in the central part. In this study, we modeled two dimensional shallow geological structure across the faults mainly based on gravity survey. And we discussed the structural relationship between the faults and the Tsunatori fault, which trends parallel to the faults, and lies to the west.

The gravity survey was conducted across the faults with a Sintrex gravity meter CG-5 along an E-W survey line, 12 km long. The typical interval of observation sites is 200 m. The elevation of the sites was surveyed with RTK-GPS. Acquired gravity data was processed to obtain Bouguer anomaly mostly according to the methodology of Geological Survey of Japan, AIST (2004). We assumed that the density for Bouguer and terrain corrections were 2.2 g/cm<sup>3</sup>.

Obtained Bouguer anomaly after trend correction shows lower value around the western marginal faults, and higher value in the eastern and western areas. The difference between these values is about 20 mgal. We assume three layers in our model, which have densities of 2.1 g/cm<sup>3</sup> (layer 1), 2.5 g/cm<sup>3</sup> (layer 2) and 2.7 g/cm<sup>3</sup> (layer 3), respectively. The interpretation of the model is as follows. Layer 1 is correlated to the surface covers, Pliocene and upper Miocene sedimentary rocks, layer 2 middle Miocene sedimentary rocks, and layer 3 basement rocks.

In the model, two half-grabens, filled with middle Miocene, develop below the western sides of the western marginal faults and the Tsunatori fault, both of which constitute listric boundary faults of the half-grabens. And they show thrusting displacement. We will discuss the development of this inversion structure in detail.

### References

- Geological Survey of Japan, AIST, 2004, Gravity CD-ROM of Japan.
- Kato et al., 2006, Journal of Structural Geology, 28, 2011-2022.

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