

Fault geometry of the Nodera fault of the Ouchigata fault zone in the southern part of Noto Peninsula, central Japan.

*Keita Takahashi¹, Kenta Kobayashi¹

1. Department of geology, Faculty of Science, Niigata University

The Ouchigata fault zone is a reverse fault type active fault zone showing NE trending located in central Ishikawa Prefecture (The Headquarters For Earthquake Research Promotion, 2005). Although the main fault zone is continuously distributed along the northwest margin of the Houdatsu Hills, in the southwestern region of the Ouchigata fault zone, the fault shows a distribution that branches and runs parallel from the plain to the hills. Among them, the Nodera fault and the Tsuboyama - Yano fault which constitute the hill side have been shown to have different postures and elevation directions of the fault plane, but the factors have not been clarified, and examples of structural geological studies poor. In this study, field survey, sample analysis and fault analysis were conducted with the purpose of elucidating the morphology and fault geometry of Nodera fault and fault of the estimated inside hills.

The geology of this research area is widely distributed in the Jurassic granitic rocks called the Houdatsusan granitic body, and partly covered in the quaternary.

In this study, the outcrop of the fracture zone was found at the side extension of the Nodera fault. In addition, we found a fracture zone running parallel from the hills of the west side of the Nodera fault. These fracture zone outcrops generally show NNE - SSW trend, the outer edge fault gouge shows oblique deviation sense from lateral displacement, while the fault gouge at the center axis shows reverse fault sense including left lateral deflection component. In addition, in this research area, many faults showing lateral sense are distributed from oblique deviation of NNW - SSE trend, and faults of some NNW - SSE and NW - SE trend faults are distributed.

Stress analysis by multiple inverse method (Yamaji, 2000) was carried out using data obtained from these fault planes. As a result, stress 1 indicating NNE-SSW compression and stress 2 indicating WNW-ESE compression were obtained. Stress 1 corresponds to fault gouge data showing oblique deviation sense from lateral displacement of fault of NNE - SSW trend and fault gouge data showing reverse fault sense of NW - SE trend. These are considered to be formed before the stress 2 because they are cut into the fault plane corresponding to the stress 2. The data obtained from the central axis of the fault of NNE - SSW and NNW - SSE trend showing reverse fault sense corresponded to stress 2. This stress is consistent with the current maximum horizontal compressive stress direction by Tsukahara and Ikeda (1991) and CMT (Centroid Moment Tensor) solution of 2007 Noto Peninsula earthquake.

X - ray diffraction analysis was performed on the fault gouge of the fracture zone of the main NNE trend. As a result, the sample at the outer edge of the fracture zone contained a lot of illite and the sample at the center axis contained much smectite. From this, it is considered that the outer edge of the same fracture zone and the central gouge are formed in different environments.

In the previous study (Misaki, 1980), the Nodera fault was regarded as a pure reverse fault sense, but data obtained at the outcrop of the fracture zone may be associated with left lateral deflection component. This is in harmony with the surrounding tectonic relief. In addition, based on the results of stress analysis and X-ray diffraction analysis, it is considered that the faults running along the Nodera fault and the inside of the hills are currently active by reusing previously formed faults.

Keywords: active fault, Ouchigata fault zone, Nodera fault, fault rocks