Determination of the deformation conditions of the Shajigami Shear Zone developed in Fukushima Prefecture, northeast Japan, based on deformation microstructures of mylonites

*Shunsuke Watanuki[1], Shuya Hisasue[1], Takuto Kanai[1], Hideo Takagi[1]

1. Waseda University

The Shajigami Shear Zone (Yamamoto et al., 1989) extends NE–SW in the South Kitakami Belt, eastern margin of Abukuma Mountains, northeast Japan. Hisada and Takagi (1992) reported that the granodiorite mylonite indicate a sinistral shear whereas the granodiorite cataclasite and the limestone mylonite indicate a dextral shear. In this presentation, the deformation condition is estimated based on the lattice preferred orientation (LPO) and the grain size distribution of recrystallized quartz of the granodiorite mylonite and calcite of the limestone mylonite are measured using SEM–EBSD.
The granodiorite mylonite is distributed along the Shajigami Fault and mostly overprinted cataclasis. The mylonites show quartz LPO patterns suggesting activity of rhomb <*a*> and/or prism <*a*> system. The microstructures and LPO patterns suggest dislocation creep took place at about 400 ˚C (Takeshita, 1996; Passchier and Trouw, 2005). The mean grain size of recrystallized quartz ranges 13.8–21.1 μm.
The grain size (mean: 16.9–46.9 μm) of recrystallized calcite in the limestone mylonite is minimum along the fault. Asymmetric deformation microstructures indicate a dextral shear, but some calcite porphyroclast preserve a microstructure of former sinistral shear. The LPO is characterized by a maximum of the *c*–axes in the Z direction rotating clockwise (10–20˚). The *a*–axes are distributed within a girdle in the XY plane. The twin geometry of calcite grains indicates the plastic deformation above 200 ˚C (Burkhard, 1993). Hisada and Takagi (1992) estimated the granodiorite cataclasites are formed up to 90 Ma.
In conclusion, the granodiorite mylonites are deformed at about 400 ˚C after 105 Ma (hornblende K–Ar ages; Agency for Natural Resources and Energy, 1990). After the strike–slip inversion, the limestone mylonites and granodiorite cataclasites were formed at 200–300 ˚C up to 90 Ma.

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