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Structural analysis of shear zone developed in Sakaitoge Fault

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Active fault zones and their related cataclastic fault rocks formed by seismic faulting at shallow depths within the upper crust are closely related to the long-term seismicity and tectonic history of faults. Studying on deformation structures of active fault zones, therefore, provides important information for accessing the long-term seismic faulting behaviors and understanding the tectonic environment and history of active faults. In this paper, we present a case study on the fault shear zone structures developed along the Sakaitoge-Kamiya Fault, central Japan by field investigation and meso- and microstructural analyses of fault rocks.

The Sakaitoge Fault, the northern segment of the NW-SE trending Sakaitoge-Kamiya Fault zone, extends for about 30 km in the southern Hida Mountains of central Japan. Previous studies show that the total displacement is about 4.5 km, having a left-lateral strike-slip movement sense and that the youngest seismic event occurred in the past 1400 yr (Kano et al., 2001).

Field investigations and meso- and microstructural analyses reveal that the shear-zone of the Sakaitoge Fault is mainly composed of non-foliated cataclasite and foliated cataclasite, fault gouge and fault breccia. The foliations and Riedel shear structures indicate a uniform left-lateral strike-slip sense. The foliations developed in both the cataclasite and the fault gouge shows that the Sakaitoge Fault had been moved in the same shear sense since the formation of cataclastic rocks.

Keywords: Sakaitoge fault, shear zone, foliation