

Tectonic development along the Hinagu fault zone, Kumamoto Prefecture, Japan

*Kenta Kobayashi¹, Keiji Ogashiwa¹

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

The Futagawa and the Hinagu fault zones were activated at the time of the 2016 Kumamoto earthquake. To understand how fault zones have developed over a long period of time, it is necessary to observe fault zone structures at the macro to microscope scales. We carried out field surveys in the aftershock area of the earthquake, and analyzed the meso-structures of the brittle fault rock zones and porphyry dikes.

Paleo-stress field and K-Ar age of the porphyry were determined.

NNE-SSW striking remarkable brittle shear zone was recognized in the Hinagu Formation (Early Cretaceous), indicated dextral-normal slip sense (2nd stage). On the other hand, outside of the shear zone, indicated sinistral slip sense (1st stage). The shear zone was intruded by porphyry dikes, and cut by NNW striking sinistral and E-W striking dextral minor faults (3rd stage). Based on the slip sense of the 2nd stage faults and geometry of the dikes, paleo-stress field was determined as strike slip to normal type. The K-Ar age of the porphyry was dated as 21.78 ± 0.56 Ma.

Brittle fault rock zones were also distributed in the Higo metamorphic rocks. The macroscale fault zone in the aftershock area has a long history of deformation and complicated structure. Parts of them were selected, and activated at the time of the aftershocks.

Keywords: Kumamoto Prefecture, Hinagu fault, active fault, fault rocks