

Multidisciplinary borehole investigation project of the MTL and the Neodani Fault

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The recent fault activity is often revealed from trench excavating investigations that clarify the cross-cutting relationship and depositional age of overlying sediments (hereinafter, this is called "covering bed method"). In some areas, however, this method cannot be applied due to the lack of any overlying sediment and sample or age indicator. In such cases, fault activity is evaluated on either direct dating or microstructural characterization of fault rocks. Now we started up new project to improve fault activity evaluation methods. This project is aimed to evaluate fault activities in terms of understanding microstructural differences of fault rocks between active fault and inactive one.

This project takes multidisciplinary approaches including field surveys, borehole drilling and laboratory analysis. In field surveys we conduct detail observation of fault damage zone and collect samples. In this presentation, we present preliminary result from field observation. In borehole surveys we conduct a deep borehole drilling (up to 1,000m length), physical logging, and various borehole tests. In laboratory analysis we perform microstructural observation, X-ray CT (Computed Tomography) image analysis, chemical analysis, etc., and focus on the relationship between mineral veins and fault plane, in particularly.

We target two faults, the Median Tectonic Line (MTL) and the Neodani Fault, because theses faults have been well-studied previously in terms of covering bed method. We have selected Yuyaguchi site (Saijo City, Ehime Pref.) of the MTL as a representative of inactive fault section. Whereas, Kadowaki-Kinbara section (Motosu City, Gifu Pref.) of Neodani Fault is selected as an active fault section which has been recorded the largest displacement during 1891 Nobi earthquake in Japan.

We will principally investigate fault activity focusing on microstructural characterization and attempt to get practical results.

Keywords: Median Tectonic Line (MTL), Neodani Fault, fault damage zone, borehole drilling, mineral vein, microstructure