

Comparison of fault structures between seismic and aseismic domains along the Atotsugawa fault system

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The Atotsugawa fault is a right lateral strike slip fault, which is one of the most active faults in the Niigata-Kobe Tectonic Zone. Recent observation of deformation rate using GPS network by the Geographical Survey Institute, and Dense GPS network across the Atotsugawa fault system clarified that there is heterogeneous distribution of deformation along the fault system. In addition, the investigation of the electrical resistivity structure by using MT method suggests that highly conductive zone exist deep beneath the crust [Goto et.al. 2004].

This study examined two drill cores recovered from the different locations along the Atotsugawa fault, one is from the Atotsugawa area where creep motion has been suspected associated with very low seismicity. Another is from Miyagawa area, where large numbers of micro-earthquakes occur along the fault. The fault zone around the area has been supposed to be locked. The Miyagawa core contains some fracture zones and a couple of gouge layers, 10 m in thickness. In order to characterize the fractured zone, we polish the surface of the half-cut core across the largest gouge layer, which make it possible to see the fracture profile clearly. Thin sections are prepared for each of the core pieces. Thus, our scale of the observation of fault zone ranges from micro meter to meter.

There are many ways to investigate of the seismogenic process along the active fault zone. This study draws a comparison of micro to meso structures of the fault zone, between the two contrasting zone of slip behaviors. If the low-seismicity and high-seismicity segments show contrasting characteristics from the view point of the materials and structures, our observation can help to reveal the seismogenic process and also identify the regions, which have possibilities to generate a large earthquakes.