Japan Geoscience Union Meeting 2012
(May 20-25 2012 at Makuhari, Chiba, Japan)

SSS38-31 Room:303 Time:May 24 11:15-11:30

Continuous coring and logging dataset obtained from fossilized megasplay fault

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Mechanics and evolution of large thrust faults along subduction plate boundaries are one of the essential topics in earth sciences because of their potential for causing catastrophic geohazards. Megasplay faults, large landward-dipping thrust fault braching from plate boundary megathrusts, are one of the candidates for the source of large tsunamis. Deep portion (˜5200 mbsf) of the megasplay fault in the Nankai Trough is listed for the next drilling target of the NanTroSEIZE project. In such depths, the megasplay fault is recognized as strong reflector of seismic profiles, however, the thickness, architecture, deformation styles of the fault zone is still ambiguous. To evaluate the status of modern megasplay fault before drilling, we projected drilling, coring and logging to the Nobeoka thrust, Japan, a fossilized on-land analog of such megasplay fault and its basic setting has been constrained (Kondo et al., 2005): Nobeoka Thrust Drilling Project (NOBELL).

Drilling operation continued from July to September, 2011. Coring was operated up to 255 m depth with excellent recovery (99.82%). Visual core descriptions including detail sketch, lithological and structural characterization, measurements on 3,787 structural elements, were performed on the whole core. Subsequently, geophysical logging (temperature, spontaneous potential logging, natural gamma-ray, resistivity, P/S-wave velocity, neutron porosity, caliper) and borehole imaging (optical and ultrasonic wave) were operated and continuous dataset from 12 to 252 m-depth were obtained. Cores were stored in Kochi Core Center (KCC) at Kochi University, and gamma-ray density, magnetic susceptibility measurements were performed by a multi-sensor core logger.

Although analyses of core description and logging dataset are now in progress, various cataclasites and slip zones possibly reflecting protolith type and deformation mechanisms, and many spikes on logging data have been recognized. The results of NOBELL would provide new insights on not only the architecture but mechanics and evolution of ancient and modern megasplay faults.