

## Preliminary Results from NanTroSEIZE IODP Expedition 314, LWD Transect across the Nankai Trough off Kumano

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The first IODP NanTroSEIZE expedition (Exp.314) was successfully completed using the Deep-Sea Drilling Vessel Chikyu of JAMSTEC-CDEX. We spent 56 days on site, carrying out scientific drilling in the Kumano basin off the Kii peninsula from September 21st to November 15th, 2007. The Nankai Trough Seismogenic Zone Experiments (NanTroSEIZE) is a multi-year, multi-leg and multi- platform project to investigate fault mechanics and seismogenesis along a subduction megathrust through direct sampling, in-situ measurements, and long-term monitoring.

During Expedition 314, we drilled into five NanTroSEIZE sites. Using the LWD (Logging-While-Drilling) technique, we obtained continuous vertical profiles of physical properties such as bulk density, resistivity, porosity, P-wave velocity, and borehole images. These sites include one frontal thrust site C0006 at toe of the accretionary prism, forearc basin deposits site C0002, a shallow part of the megasplay site C0004, and highly-deformed rocks of the interior of the accretionary prism sites C0001 and C0003.

Drilling conditions were severe at three sites due to strong deformation within the thrust sheet, caused by plate conversion and possibly by interseismic stress accumulation. Furthermore, operations were conducted under the strong Kuroshio Current, which was often stronger than 4 knots. However, with the drilling capability of Chikyu we successfully completed drilling down to 400 m to 1400 m below the sea floor and obtained high quality in-situ physical properties as well as borehole images.

Images of the borehole walls using electrical resistivity allow us to deduce the stress conditions at each drill site. We found that the stress condition and geologic structure of the uppermost 1-1.5km of accretionary prism is very different above seismogenic zone, between the thrust sheet above the mega-splay (Sites C0001 and C0004) and landward side of the Kumano forearc basin (Site C0002). These data are useful to infer the formation process of the accretionary prism and seismogenic mechanisms in the Kumano basin.

At Site C0002, we identified a methane hydrate-rich zone at 220 to 400 m below the sea floor based on high resistivity image and low gamma ray data. Hydrates are concentrated in sandy layers of numerous turbidites in this zone.

Our expedition 314 ended up with great success; continuous images and properties were obtained as a transect. These not only improve our scientific understanding toward seismogenesis, but also serve as geotechnical use for the coming riser drilling.