

SSS019-P06

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## NanTroSEIZE Stage 2 operation overview

Yusuke Kubo<sup>1\*</sup>, Nobuhisa Eguchi<sup>1</sup>, Sean Toczko<sup>1</sup>, Kyoma Takahashi<sup>1</sup>,  
Exp 319/322 Science Parties<sup>2</sup>

<sup>1</sup>CDEX, <sup>2</sup>N/A

D/V Chikyu completed Stage 2 of Nankai Trough Seismogenic Zone Experiment (NanTroSEIZE) in 2009. Stage 2 was composed of two expeditions; Expedition 319 Riser/Riserless Observatory 1 and Expedition 322 Subduction Inputs.

Operation of Exp. 319 included riser drilling, analyses of cuttings and core samples, downhole measurements and wireline logging, and casing at Site C0009 in the Kumano forearc basin as well as riserless drilling, logging while drilling (LWD), measurement while drilling (MWD), casing, and observatory operations at Site C0010 across a major splay fault. In addition, LWD data was collected at Site C0011 in advance of planned coring operations in the following Exp. 322.

Riser drilling at C0009 was the first in IODP history, and it allowed several unprecedented operations including in-situ measurements of pore pressure, permeability and minimum principal stress magnitude, real-time mud gas analysis, and laboratory analyses of cuttings. After the hole was cased for future observatory installation, long-offset (up to 54 km) two-ship active seismic experiment was conducted, in collaboration with R/V Kairei.

At riserless Site C0010, operations included drilling with MWD/LWD across the megasplay fault to 555 mbsf, casing the borehole with screens at the depth of the fault, conducting an observatory dummy run to test future strainmeter and seismometer deployment procedures, and installation of a temporary pore pressure and temperature monitoring system.

Exp. 322 was a riserless expedition that drilled at two sites in the Shikoku Basin. Site C0011 was located on the northwest flank of a prominent bathymetric high (Kashino-saki Knoll) that was constructed on the subducting Philippine Sea plate, whereas Site C0012 is located near the crest the knoll.

At Site C0011, RCB coring started at 340 mbsf. Riserless drilling continued until drill bit failed at 881 mbsf. Sporadic presence of hard layers, such as tuffaceous sands and carbonate concretion, caused damage on drill bit before reaching the original target depth at ~1200 mbsf. Core recovery was 68.1%, but severe drilling disturbance often resulted in low quality core samples. LWD data proved useful in core-log-seismic integration.

At Site C0012, we drilled through sedimentary strata to reach the underlying basalt at 540 mbsf. Full record from the sea floor to basement provided changes in characteristics of incoming material prior to their arrival at the subduction front. Wireline logging operation was cancelled due to poor hole conditions and bad weather.

Keywords: Nankai Trough, Riser drilling, IODP, Chikyu