

In-site stress estimation and evaluation in IODP expedition Site C0002, NanTroSEIZE
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The main target of NanTroSEIZE (Nankai Trough Seismogenic Zone Experiment) is attempting to understand the stress field and stress state in the vicinity of the mega-Thrust. Until now, three IODP expeditions run for the Nankai subduction zone had accomplished. Scientific drilling vessel, Chikyu, carried out the drilling operations and collected much valuable data including LWD, core samples. Site C0002 is planned to drill over 7 kilometers to recover the fault zone material and on-site experiments data. However, the drilling operation stopped in the middle of accretionary prism because the borehole conditions and technical problems. In the stage 1, C0002A borehole was drilled from 1964.5mbrf (0mbsf) to 3336mbrf without any problem. The drilling was complete in one week on 18th October 2007. This riser-less drilling used seawater (1.03S.G) for drilling mud. In this riser-less drilling, we can observe the clear breakout in entire borehole from shallow to deep. Due to the difficulties of drillings in the following expeditions, exp.338, C0002F kept drilling 12.24-inch LWD borehole to 2005.5mbsf and abandoned at this depth by suddenly increasing wind. In the exp.348, the difficult drilling state happened in very early beginning. The sidetrack borehole, C0002P, overcame the high fractures zones and highly tilted structure to reach the center of inner accretionary wedge. Very few breakout occurred in both riser drillings, the big amount of cutting recovered indicated the weak formation collapsed and enlargement of borehole radius. In this research we try to construct the geomechanical model to explain the drilling difficulties and stress environments in the borehole. The related drilling parameters and formation compositions in these boreholes are considered as the model variables. Depending on 2-D stress model in each borehole, we combine the observation and simulated model to scope the possible stress model in the depth near the megathrust.

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