

Structural characteristics of Nankai accretionary prism at C0002: Preliminary results from IODP Expedition 348

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Integrated Ocean Discovery Program (IODP) Expedition 348 has deepened hole down to 3058.5 mbsf at Site C0002, and collected cutting and core samples of Upper Miocene Nankai accretionary prism. The structural key observation made on cuttings in Holes C0002N and C0002P, and cores retrieved in Hole C0002P are:

a) The structures observed in intact cuttings include slickenlined surfaces, scaly fabric, deformation bands, minor faults and mineral veins. Slickenlines are observed throughout the whole interval, but scaly fabric is increasingly observed below ~2200 mbsf. The other types of structures are scattered throughout the whole section.

b) The cored interval is characterized by steep bedding planes (more than 75°). A fault zone, 90 cm in thickness, with a few mm-size angular clasts is present in one of the cores (2204.9~2205.8 mbsf). In its present position, the brittle fault zone is associated with a normal faulting sense. It is unclear if this represents an early thrust rotated after its development or late normal fault.

c) SEM images in the upper part of Hole C0002N show little evidence for opal diagenesis, implying $T < 60-80$ °C at 1225.5 mbsf. In Hole C0002N, the fabric lacks a strongly preferred orientation in clay-rich materials, except along striated micro-faults formed by clays. These zones are extremely localized with a thickness of a few microns or less. In Hole C0002P, below 2200 mbsf, SEM images show the development of a regularly spaced fabric in sandstones, constituted by thin (<0.1 μm), clay-dominated shear planes. Towards the base of the hole, below 2625 mbsf, compaction fabrics in clay-rich materials can be observed. Very thin shear zones with almost no wall damage zone have cut this fabric.

The overall character of the deformation (independent particulate flow with limited evidence for cataclastic deformation) is suggestive of that deformations occurred in a relatively shallow environment (approximately 0-4 km in burial depth).

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