

Outline of the large structure drilled at Site C0002 based on the interpretation of logging while drilling (LWD) images and geophysical log response.

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During the International Ocean Discovery Program (IODP) Expeditions 338 and 348, which is part of the NanTroSEIZE (Nankai Trough Seismogenic Zone Experiment) project, three deep riser holes were drilled south of the Kii Peninsula at Site C0002. The site is located in the Kumano forearc basin above the seismogenic portion of the plate boundary thrust.

Hole C0002F (Expedition 338) was drilled down to 2004.5 mbsf. Hole C0002N/C0002P (Expedition 348) was drilled down to 3058.8 mbsf. Hemipelagic mudstone and sand/silt sediments are the predominant lithologies (Moore et al., 2014; Tobin et al., 2015). A complete set of logging while drilling (LWD) data, including borehole images, was collected during IODP Expeditions 338/348.

Distinct sections of intense fracturing and faulting within the very clay-dominated lithology were characterized on LWD borehole oriented images and other geophysical logs (Boston et al., 2016). The intense deformation of the generally homogenous lithology is characterized by bedding that dips steeply (60-90°). This research presents the Characterization of the different types of structures and their specific position within the accretionary prism and within the fault zones identified on 338 and 348 Expeditions datasets.

Fractures and bedding measurements result on a large database of geometrical and precise structural information. A main focus of this research was the identification and geometrical characterization of the potential active structures within the accretionary prism, fractures and fault structures from the deep Nankai Trough accretionary prism in Japan.

The structural interpretation of borehole images illustrates the deformation within the fractured and faulted sections of the accretionary prism. The interpretation of the images of both Hole C0002F and Hole C0002P reveals distinct areas of intense fracturing and faulting within a very clay-dominated lithology. On Hole C0002P LWD images evidences exist for the interpretation of fault zones and fault planes. Previous LWD images datasets acquired in previous NanTroSEIZE IODP Expeditions (Expedition 314, Expedition 319) are being revised based on Expedition 348 results. Results of this research contribute with new structural data to achieve a more complete interpretation of the internal geometries and structures of the Nankai Trough accretionary prism at depth.

References

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