

Preliminary structural geology results of IODP Expedition 338

Asuka Yamaguchi^{1*}, Toru Takeshita², Jacob Geersen³, Olivier Fabbri⁴, Kiyokazu Oohashi⁵, Yehua Shan⁶, Kyuichi Kanagawa⁵, Expedition 338 Scientists⁷

¹AORI, Univ. Tokyo, ²Hokkaido Univ., ³Univ. Southampton, ⁴Univ. Franche-Comte, ⁵Chiba Univ., ⁶Guangzhou Institute of Geochemistry, Chinese Academy of Sciences, ⁷IODP Expedition 338

Integrated Ocean Drilling Program (IODP) Nankai Trough Seismogenic Zone Experiment (NanTroSEIZE) Expedition 338 took place from October 1, 2012 to January 13, 2013. This expedition was originally planned to extend riser Hole C0002F from 856 to ~3600 mbsf. However, riser operations at Hole C0002F were suspended at 2005.5 mbsf because the riser pipe was damaged by unfavorable wind/current conditions. Contingency riserless operations including coring at Site C0002 (200-505, 902-940, and 1100.5-1120 mbsf), LWD at Sites C0012 (0-709 mbsf) and C0018 (0-350 mbsf), and LWD and coring at Sites C0021 (0-294 mbsf) and C0022 (0-420 mbsf) have been performed instead of deepen Hole C0002F. Here we report the preliminary results of Expedition 338 shipboard structural studies.

During Expedition 338, two types of sample material were used for structural geology analyses: (1) cuttings (1-4 mm and >4 mm size fractions) sampled at 5-10 m intervals between 865.5 and 2004.5 mbsf during riser drilling of Hole C0002F, and (2) cores recovered from intervals of 200.0-1112.84 mbsf at Holes C0002H, C0002J, C0002K, and from intervals of 0-419.5 mbsf at Hole C0022B. For the cuttings from Hole C0002F, deformation structures such as vein structures, carbonate veins, slickenlined surfaces, and minor faults, were observed as well as high number of drilling-induced deformation structures. Between 1550.5-1675.5 mbsf, up to 10% of investigated cuttings show slickenlined surfaces. This is correlatable with the high fracture concentration interval identified by LWD resistivity images. Abundant bedding, faults and deformation bands are observed in the cores retrieved from Holes H, J, K and L at Site C0002. Deformation structures are rarely observed in cores from the upper part of the Kumano Basin deposits (Unit II), while they are numerous in cores from the lowermost part of the Kumano Basin sediments (Unit III) and from the accretionary prism sediments (Unit IV). At Site C0022, orientations of bedding dip and minor faults appear to change across the possible splay fault. The existence of highly fractured or disturbed material and claystone with planar fabrics suggest that the interval of 100-101 mbsf is a plausible candidate for the location of the splay fault at Site C0022.

Keywords: IODP Expedition 338, NanTroSEIZE, Site C0002, Site C00021, Site C00022