

Principal horizontal stress orientations in Kumano forearc basin from IODP NanTroSEIZE drilling Site C0009

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A new 1.6 km deep rise-drilling borehole was penetrated at site C0009 in the center of Kumano forearc basin as a landward extension of the previous stage of Nankai Trough Seismogenic Zone Experiment (NanTroSEIZE) in southwest Japan subduction zone. We determined and provided a new data set of principal horizontal stress orientation at this site by analyses of borehole breakouts and drilling induced tensile fractures using wireline logging FMI images and caliper data. Then, we carried out comparison of stress orientation between C0009 and C0002 where an unexpected stress orientation result was obtained in the previous stage. The results showed the maximum horizontal stress orientation at C0009 is generally parallel with the convergence vector between the Philippine Sea plate and Japan, but orthogonal with the stress orientation at C0002. Therefore, it is obvious that horizontal stress orientations are not uniform in the forearc basin within the surveyed depth range (shallower than 1600 meters below sea floor). In addition, the stress orientation at C0009 rotated approximately 30 - 40 degree clockwise accompanying going to deeper from the basin sediments to the accretionary prism in the same manner with C0002 (Figure 1).

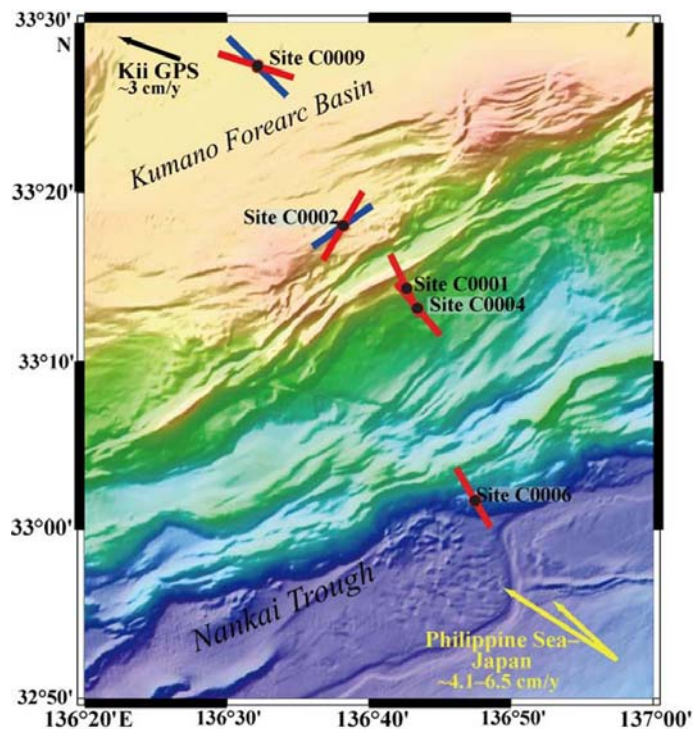


Figure 1. Bathymetric map, and the maximum principal horizontal stress orientations at the new site C0009 and the previous sites C0001, C0002, C0004 and C0006 (Tobin et al., 2009). Red and blue lines at the drilling sites show the maximum horizontal stress orientations. Blue lines: the stress orientation in accretionary prism. (Lin et al., in prep.)

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