

What will be obtained by deep drilling to the seismogenic zone in Nankai accretionary prism?

Yujiro Ogawa[1]; Kiichiro Kawamura[2]; Ryo Anma[3]; Hidetoshi Hara[4]; Shunsuke Kawakami[5]

[1] Earth Evolution, Univ. Tsukuba; [2] FGI; [3] Life-Environment, Tsukuba Univ.; [4] Inst. Geosci., GSJ, AIST; [5] Geoscience, Tsukuba, Univ.

We obtained interesting types of strongly foliated exhumed metamorphic and/or deformed rocks from the Nankai accretionary prism through observation by using JAMSTEC submersibles along the two deep eroded canyons off Kii and Tenryu areas. As a result the following interpretations were obtained. Most of the rocks are of turbidite in origin, and considerably deformed in spite of their young age, less than 3 Ma. In particular rocks along the out-of-sequence thrusts, one in the Kumano thrust, another in the Tokai thrust, are so-to-speak slate or even schist, including high illite crystallinity showing 230 degree Celsius at the maximum. At least five deformation stages are elucidated, one parallel to subparallel to bedding plane, others oblique with isoclinal microfolds, and others deformation bands and kink bands. Also fluid isotope chemistry of oxygen and carbon from calcite veins and cements from the seepage zones indicated high temperature character, suggesting deep thermal origin, similar to those from active faults or thermally induced hot spring fluid, different from those from the surface of the prism by means of surface circulation of biogenic fermentation origin. Thus, the rocks along the two canyons indicated exhumed prism rocks and deep origin fluid as well as the thrust and folded internal structures. If the deep drilling is held in the out-of-sequence area, we will obtain such foliated rocks which were exhumed along the seismogenic zone related faults. Most of the rocks are treated to be deformed in several stages, from the prograde deformation-metamorphism as well as retrograde. At the latest, gravity slide occurs to modify the total structure, most specifically in the Zenisu and Paleo-Zenisu subduction-collision zone in the eastern Nankai prism.