

## Evolutionary process of the Nankai inner accretionary prism estimated by vitrinite reflectance analysis and zircon U-Pb age dating of deep borehole samples

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The Nankai accretionary prism has been grown with the plate convergence between the Eurasian/Amur and the Philippine Sea Plate. To evaluate the evolutionary processes of the Nankai inner accretionary wedge, we performed vitrinite reflectance analysis and detrital zircon U-Pb age dating using cuttings retrieved from the Integrated Ocean Drilling Program (IODP) Site C0002 located within the Kumano Basin and penetrates the inner accretionary wedge down to 3058.5 m below the seafloor (mbsf).

Although  $R_o$  values of vitrinite reflectance tend to increase with depth, there are two reversals (1300–1500 mbsf and 2400–2600 mbsf) of  $R_o$  values. The youngest detrital zircon U-Pb age of the cuttings from 2600.5 mbsf is  $\sim 7.41$  Ma, which is obviously younger than shipboard nannofossil ages (9.56–10.54 Ma) at 2245.5 mbsf. Both  $R_o$  values and the youngest detrital zircon U-Pb ages show a reversal between 2400–2600 mbsf, suggesting the existence of a thrust fault with sufficient displacement to offset both paleothermal structure and sediment age.

Despite similar depositional age and paleogeothermal gradient, lithofacies in the hanging- and footwall of the 2400–2600 mbsf thrust fault are different; volcanoclastic sediments are rare in the footwall. The lack of volcanoclastic sediments corresponding to the Middle Shikoku Basin facies in the footwall of the thrust suggests that sediments below  $\sim 2600$  mbsf have similar sedimentation background to that of present off-Muroto input site sediments. Taking these information consideration, a synthesized model of tectonic evolutionary process of deep portion of the Nankai inner accretionary wedge is as follows: 1) 4 Ma: hemipelagic sediments, which deposited similar environment of present off-Muroto input, have accreted ( $\sim 4$  Ma corresponds to the age of unconformity between forearc basin and accretionary prism (Kinoshita et al., 2009)). 2) 2 Ma: The megasplay fault was activated (Strasser et al., 2009), and Site C0002 sediments moved into inner wedge. Moving direction of the Philippine Sea Plate became NNW to WNW (Kamata and Kodama, 1999). 3) present: inner accretionary wedge has been buried with formation of Kumano forearc basin. Sediments existed offshore of the  $\sim 4$  Ma source area of Site C0002 have moved to off-Muroto input with the motion of the Philippine Sea Plate.

Keywords: Philippine Sea Plate, vitrinite reflectance, detrital zircon U-Pb age