Structure of Nankai accretionary complex inferred from detailed measurements of physical properties on core /ODP samples

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Physical properties, especially porosity and grain density, are important to indicate surface deformation process and origin of sediment. In order to understand the behaviour of the M larger than 8 earthquakes in the Nankai Trough region, we made systematic measurement of surface physical properties across the deformation front in the western Nankai Trough region off Muroto, by taking piston core samples. Four research cruises, NGH99, KT00-07, NT01-00, and Bo-00, were carried out to make heat flow measurements and to take piston core samples. Eleven core samples were taken through these cruises. Physical properties measurements were carried out using two methods; by taking cube samples and by non-destructive scan. Bulk density, grain density and porosity were determined by measuring mass and weight for cube samples, using a precise balance and Penta-picnometer. Multi-Sensor Core Logger (MSCL) is a non-destructive scanner to measure bulk density, P-wave velocity, magnetic susceptibility and electric conductivity.

Grain density values are basically uniform around 2.6 g/cm^3 across the deformation front. On the other hand, porosity decreases by around 10%. This indicates that surface sediment is largely affected by the initiation of accretionary process, and large amount of pore fluid is squeezed out through this region. This porosity reduction is basically consistent with heat flow data. Grain thermal conductivity is estimated from prosity and thermal conductivity data using a geometrical mean model. Their average is 3.3 W/m/K, and does not depend on the location.

Comparison of core sample data with ODP downhole measurement data will also be presented.