Earthquake related event deposits on the mega-splay fault at Tonankai earthquake area, Nankai trough, Japan

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IODP Expeditions 316, Nankai Trough Seismogenic Zone Experiment Stage 1 has been taken core samples around mega-splay fault where coseismic slip (Ichinose et al., 2003) and tsunami source (Baba and Cumming, 2005) area of the 1944 Tonankai earthquake. Surface core sample may have been experienced many earthquake events, though characteristic structures was not found in optical observation. The X-ray computed tomography (X-CT) can emphasize small difference of sediment, even though invisible in naked eye.

Episodic event deposits are found at uppermost core of hanging wall. The X-CT can show complex structure indicating some horizontal layers, scattered mud clasts and mud-filling burrows. The mud clasts are intercalated between horizontal layers, indicating episodic event. At least five events are observed. The boundary of some mud-clasts are dim, may have suffered diffusion, and this implies very short transportation or in-situ formation. Thus, repeated mud clast deposit was not found at footwall of the fault (C0008).

Strong seismic ground motion can shake surface soft sediment, and sediment suspensions were often observed after large earthquakes (Thunell et al., 1999; Itou et al., 2000; Seeber et al., 2007). The difference of occurrence of sediment disturbance between C0004 and C0008 can be explained by hanging wall effect of seismic ground motion. It is considered that episodic sediment disturbance at C0004 was formed by coseismic rupture of mega splay fault. Because this event deposit avoid from high-energy mass flow, this is expected to preserve the record of age and area and intensity of ancient-earthquakes.

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