

Flow dynamics of Nankai Trough submarine landslide inferred from internal deformation using magnetic fabric

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Submarine landslide deposits in one of the most active subduction zone was investigated by Integrated Ocean Drilling Program (IODP) Expedition 333 as "Nankai Trough Submarine Landslides History" (NanTroSLIDE). The expedition recovered a Pleistocene to Holocene sequence of stacked mass-transport deposits (MTDs) within a slope on the footwall of the megasplay fault at Site C0018, Nankai Trough SW Japan (Strasser et al., 2012). A series of MTDs interbedded with coherent intervals were recovered from the upper 190-meter at C0018 site. We present results of detail fabric analysis using drilled succession of buried mass transport deposits in the slope of Nankai Trough in order to investigate rheology of mass transportation in the subduction zone. Despite very limited lithological information of core research, AMS is proved useful tool to identify MTD deformation and recognize depositional process of MTD (Kitamura et al., 2013, Noback et al., 2013).

Magnetic fabric patterns reveal inhomogeneity within each MTD unit indicating a different compaction and shear occurred during flowing and subsequent deposition (MTD2, MTD3, MTD5). Magnetic fabric in upper interval of each unit generally indicates vertical compression. On the other hand lower interval involve magnetic fabrics showing effect of shear. In the largest MTD (MTD6), a distribution of magnetic foliations images tightly folded strata. Using available paleomagnetic data the shear directions are reoriented, and two different directions are obtained in term of MTD flow directions. It is considered that such variation in flow types and directions derived from the results occurred in responding to a change of slope environment controlled by the tectonic evolution of Nankai accretionary wedge. Through such analysis we can improve our understanding for submarine landslide formation in the active margin.

Keywords: submarine landslide, NanTroSLIDE, IODP, Nankai Trough