Genesis of turbidite in surface deposit from the Kumano Trough, off the Kii Peninsula

Masaaki Shirai[1]; Akiko Omura[2]

[1] ORI, Univ. Tokyo; [2] ORI/Univ. Tokyo

Sand grains are distributed from land to deep marine environments. Optically Stimulated Luminescence (OSL) is mainly used as OSL dating estimating depositional age of Quaternary nonmarine to coastal deposits. For regarding OSL age as depositional age, it is necessary that enough exposure to sunlight resets OSL signal of the grains (bleaching). Whereas, ratio of bleached grains in a sample (bleaching percentage; BLP) will be able to offer significant information on processes of grain transport. Although grain is often bleached during riverine transport, opportunity of grain bleaching is restricted under marine environment. BLP of modern marine may decrease from coast to offshore due to mixing with old sediments. Whereas BLP of gravity flow deposit may depend on its origin and entrainment of old sediment. So, it is expected that BLP is an independent evidence distinguishing triggering event (flood, earthquake, and so on) of gravity flow.

The Kumano Trough located on southeast off the Kii Peninsula, central Japan would be a suitable area for formation of turbidite around the Japanese islands during Holocene based on its climatic and topographic conditions. Bleaching percentage (BLP) of alkali feldspar in a thin turbidite intercalated by hemipelagic silt at 3cmbsf of slope/bottom bounding zone of the trough was compared with BLPs of surface sand deposits of shelf margin, and sand-bar deposits from downstream area of the Kumano River. The BLP of sand layer which is equivalent with BLP of river-mouth bar sand and higher than BLPs of shelf sand and river sand suggests that the sand grains were derived from the river-mouth bar and that the gravity flow did not entrain sand grains in basal deposits. These results and depositional age of the sand layer (AD 1980's based on 137Cs concentration) suggest that the sand layer was formed by surge-like turbidity flow (Mulder and Alexander, 2001) originated from storm-induced failures on river-mouth bar.