Comparison of volcanic glasses from tephra deposits frontal prism and incoming sediments

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International Ocean Discovery Program (IODP) Nankai Trough Seismogenic Zone Experiment (NanTroSEIZE), started from 2007, has explored evolutionary processes of deformation and accretion in shallower portion of the Nankai accretionary prism (e.g. Strasser et al; 2009) with understanding the tectonic and sedimentary backgrounds (e.g. Clift et al; 2013; Pickering et al., 2013). The first workshop entitled Core-Log-Seismic Integration at Sea (CLSI@Sea) held in January-February 2018, together with IODP expedition 380 as a part of NanTroSEIZE. The expedition 380 aimed to install a new Long-Term Borehole Monitoring System (LTBMS) in the toe of the Nankai accretionary prism, while the CLSI@Sea reanalyzed the legacy data from the same site acquired during previous expeditions. Lithology group of CLSI@Sea reviewed the previous lithological descriptions and ages including the sites C0006, C0007, C0011, and C0012, of incoming sediments and toe of prism sites to understand the depositional process of slope sediments and development of decollement and the branching thrusts forming the frontal prism. At Site C0007 of NanTroSEIZE transect in off-Kumano region, present decollement lies in between Pliocene Shikoku Basin facies composed of mudstone and volcanic ash (Unit III) and Pleistocene Trench wedge/Axial channel facies (Unit IV). The sedimentary age of the bottom of Unit III (~5.32 Ma) is equivalent to that of the boundary of Unit IA and IB at C0011, Upper Shikoku Basin sediments. The Upper Shikoku Basin sediments include many tephra layers (e.g. Azuki (0.85 Ma), Pink (1.05 Ma), Habutaki (2.85 Ma), and Ohta (4.0 Ma) ashes). For better age constraint of Site C0007, we determine major and trace element compositions of volcanic glasses included in the tephra layers using LA-ICPMS. In this presentation, we report preliminary results of tephrachlonology and compare the results to that of the input sediments (Site C0011). The results will also be integrated to biostratigraphy, paleomagnetism, and detrital zircon U-Pb dating results (Clift et al., 2013). Updated high-resolution stratigraphic comparison has a potential to reconstruct the faulting/sedimentational history of the prism toe, where very-low-frequency earthquakes and slow-slip events occurs.

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