Long-term and large-scale tectonic framework controlling the seismogenic subduction zone earthquake -A case study in the Nankai Trough-

*Gaku Kimura[1], Harold James Tobin[3], Masataka Kinoshita[2]

1.Department of Earth and Planetary Science of the Graduate School of Science, The University of Tokyo, 2.Earthquake Research Institute, The University ofu Tokyo, 3.University of Wisconsin-Madison

Recent drilling into the Nankai forearc of the IODP-NantroSEIZE clarified that the wedge composed of accretion prism and forearc sediments have been formed mainly in Plio-Pleistocene after ~6 Ma and especially rapidly after ~2 Ma. The reasons for those punctuated growths seem the resurgence of subduction of the Philippine Sea Plate (PSP) at ~ 6Ma and the rapid sediment supply from the mountains in central Japan resulted from the new convergence along the eastern margin of the Amurian Plate at ~3-2.5 Ma.

The ~6 Ma resurgence of subduction of PSP appears to be synchronized with other events in the circum-PSP regions; initiations of the Mariana and Okinawa troughs opening, and subduction initiation of PSP along the Philippine Trench.
Slab pull, trench roll-back and suction forces due to the westward subduction of PSP might have promoted the opening of the both troughs as traditionally suggested by many researchers.

The ~3- 2.5 Ma rapid growth of Nankai accretionary prism off-Kii Peninsula is the same as the prism off Shikoku, which was also documented by ocean drilling about 15 years ago. Provenance analysis of the sediments of accretionary prisms documents that they flew down from the mountains in central Japan. The mountain building in central Japan is due to the collision between the northeast and southwest Japan, which is still going on, as documented in detail by many seismologic, geodetic topographic, and geologic investigations. The collision appears to have started at ~3.5 Ma to 2Ma and linked to the change in tectonic stress field in the fold and thrust belt along the eastern margin of the Japan Sea.

The eastern margin and collisional mountains in central Japan are regarded as the eastern convergent plate boundary region of the Amurian Plate as formulated by recent MORVEL plate tectonic synthesis. Eastward movement of the Amurian Plate appears to have started as suggested from intra-continent rifting due to the enhancement of deformation resulted from Great Himalayan collision.
Taking these recent tectonic events in millions year scale into account, we can explain the strange shape of subducting slab of PSP and its effect on the sesimogenic rupture zones.

