Frontal thrust activity of the Nankai accretionary prism off the Kii Peninsula

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The Nankai accretionary prism was developed since ~6Ma and the growth has been accelerated after ~2Ma. Seismic reflection profiles at the toe of the prism clearly present frontal thrust ramping up and making an axial thrust of the anticline (Figure). The fault analyses recovered from the basal decollement document that the slip along the fault was seismo-tsunamigenic high velocity because the frictional heating is clear although the specific age of the slip is unclear. The evidence of the fast slip is similar to that of the rupture and the slip propagation of the plate boundary megathrust and resulted in the disastrous tsunami in the 2011 Tohoku earthquake.
The drilling into the prism and a core-log-seismic integration study of axial thrust of the anticline document that the frontal thrusting would have started within several hundred thousand year ago because the anticline controlled sedimentation appears to have started concurrently with the start of frontal anticline. The balanced cross section profiling presents horizontal shortening of frontal prism is about ~380m. Historical record of the Nankai Earthquake since seventh century presents at least ten times with mean recurrence time is ~150 years. The largest earthquake and tsunami was M8.4 earthquake 1707. Geological records from the sediments in the ponds near the coast facing to the Pacific ocean show the tsunami deposits for about 3,000 years and suggests 300~700 recurrence of large tsunami like the1707 earthquake.
~500 m horizontal shortening of the frontal prism is cleared. Assuming the shortening took place since 500,000 years ago as inferred from the drilling data, and the shortening was concentrated along the slip on the frontal thrust dipping at 20 degree recurring at ~500 years interval, each slip is estimated to be ~0.54 m, which would have been partitioned with the plate convergence along the basal decollement. This amount would be larger if the slip recurrence intervals are longer. Vertical uplift from the anticlinal geometry requires the same amount as the slip.
Seismo-tsunamigenic slip along the decollement is already documented but fault mechanism along the branched frontal thrust is not cleared yet. This hypothetical slip estimation and fault mechanism have to be checked by fault analysis in more detail.