

Seismic evidence for tearing in the subducting Indian slab beneath the Andaman arc - Prakash Kumar, G. Srijayanthi, and M. Ravi Kumar

1. Seismological evidence for tearing of the Indian oceanic plate along the Andaman-Nicobar Island arc region is presented using high frequency body waves.
2. The thickness of the 80-90 Ma old Indian oceanic plate is estimated as ~50km.
3. We propose that discontinuities like slab tear could be locales for intense seismicity. For example, the 2005-swarm activity, due to the rupturing generated by the 26th December 2004 earthquake (Mw 9.1) occurred exactly in the region of tearing.

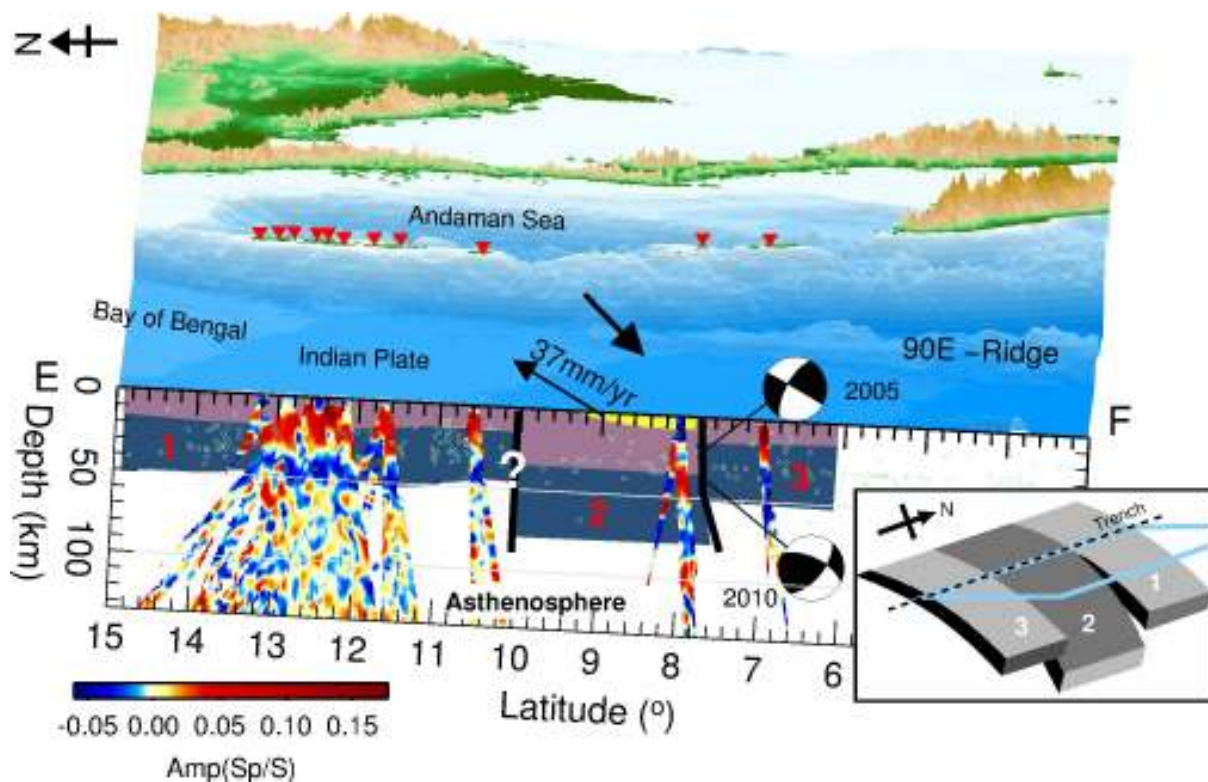


Figure: Receiver function image along the Andaman-Nicobar Island arc with the disposition of seismic station (red inverted triangles).

The positive phase (red) which is at ~10-20 km all along the profile suddenly deepens to ~40 km, where the base of the lithosphere is also deepest. The seismicity ($M_b > 5$, green dots) with mega earthquakes of 2005 and 2010 is well within the lithosphere. This abrupt offset of the middle part of the lithosphere has been interpreted as caused by the tearing in oceanic slab. The inset shows the interpretative model for the region.

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