

Full-waveform tomography illuminates 3-D anatomy of the Tibetan Plateau

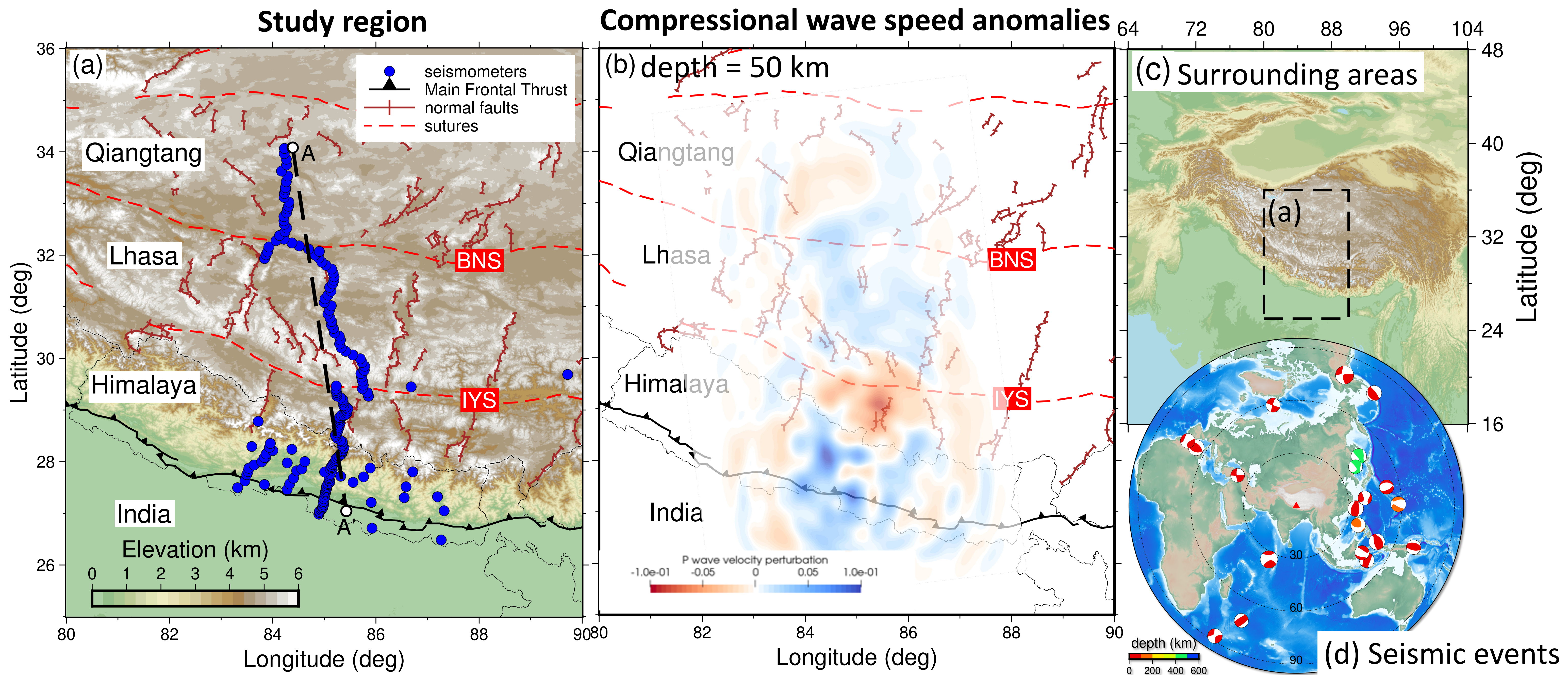
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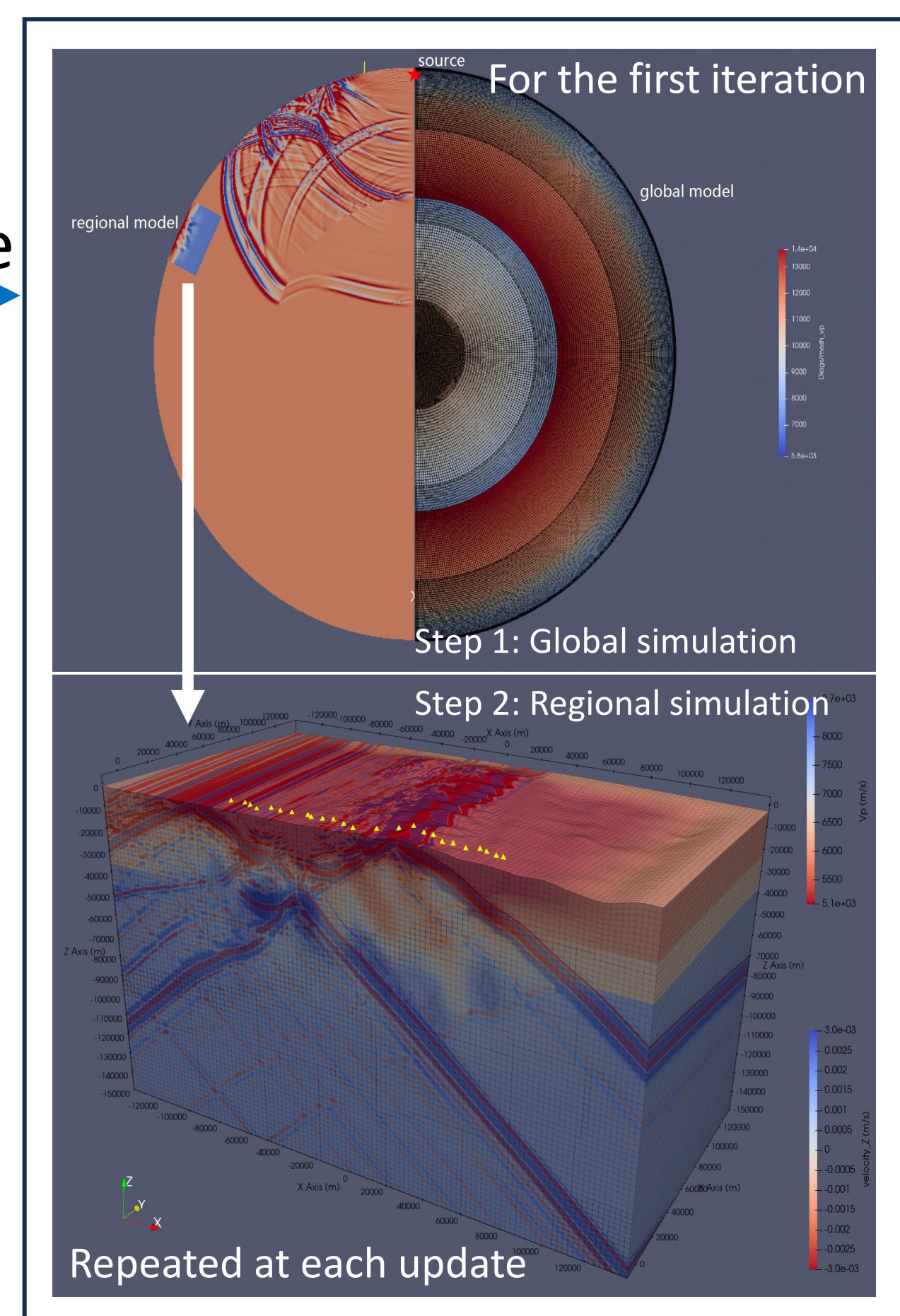
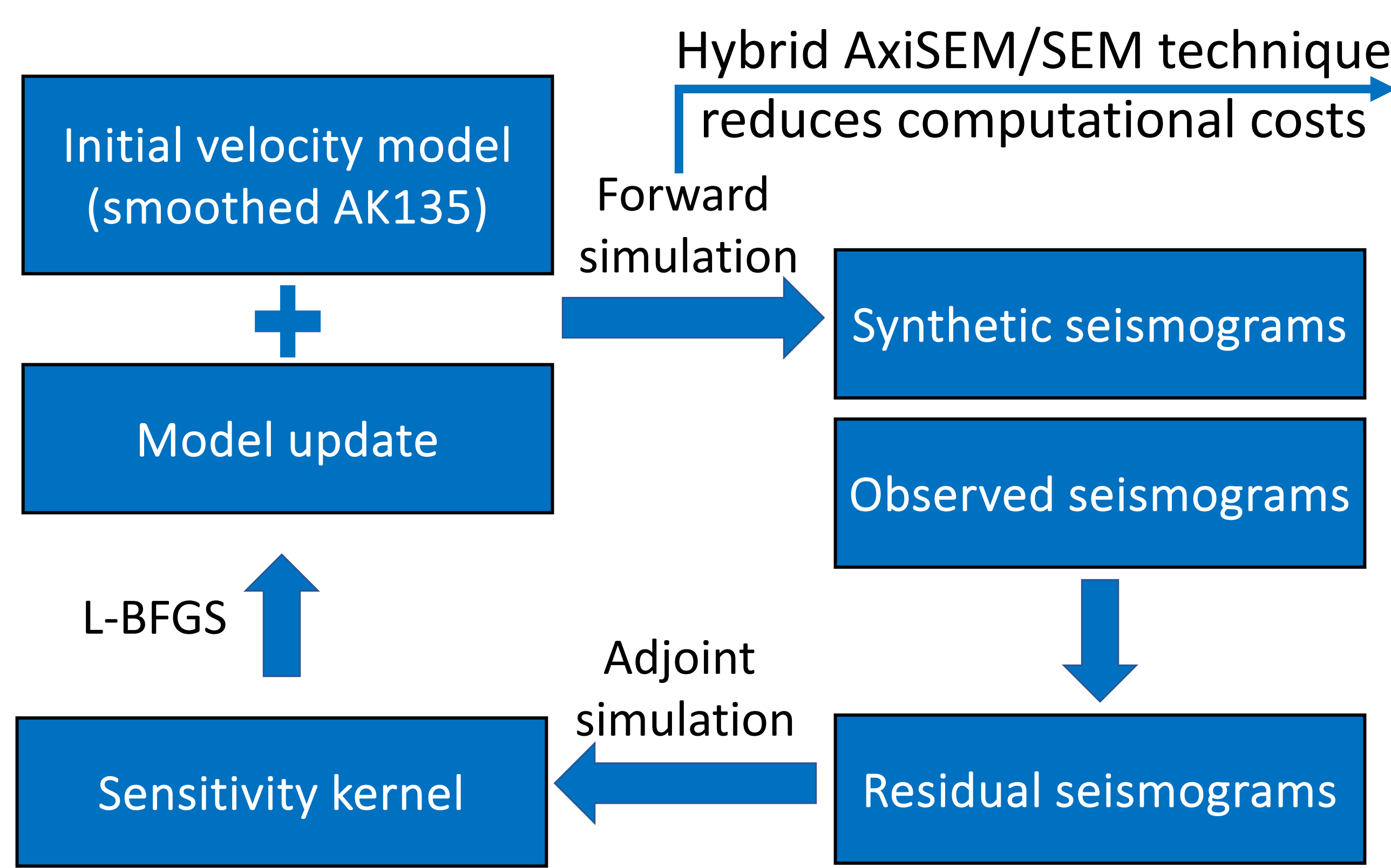


Abstract. It has been widely accepted that large-scale continental collision and subduction are involved in the formation of the giant Tibetan Plateau. The deep root (~100km) of active rifts as well as the tearing of slabs beneath the plateau are also suggested by previous tomographic studies. Here, we present a preliminary result of an ongoing tomographic study in attempt to provide refined seismic models of these geological structures with higher special resolution and multiple parameters, by further exploring the seismic waveforms (P-waves up to 0.1 Hz) from earthquakes of great distances from the Tibetan Plateau.

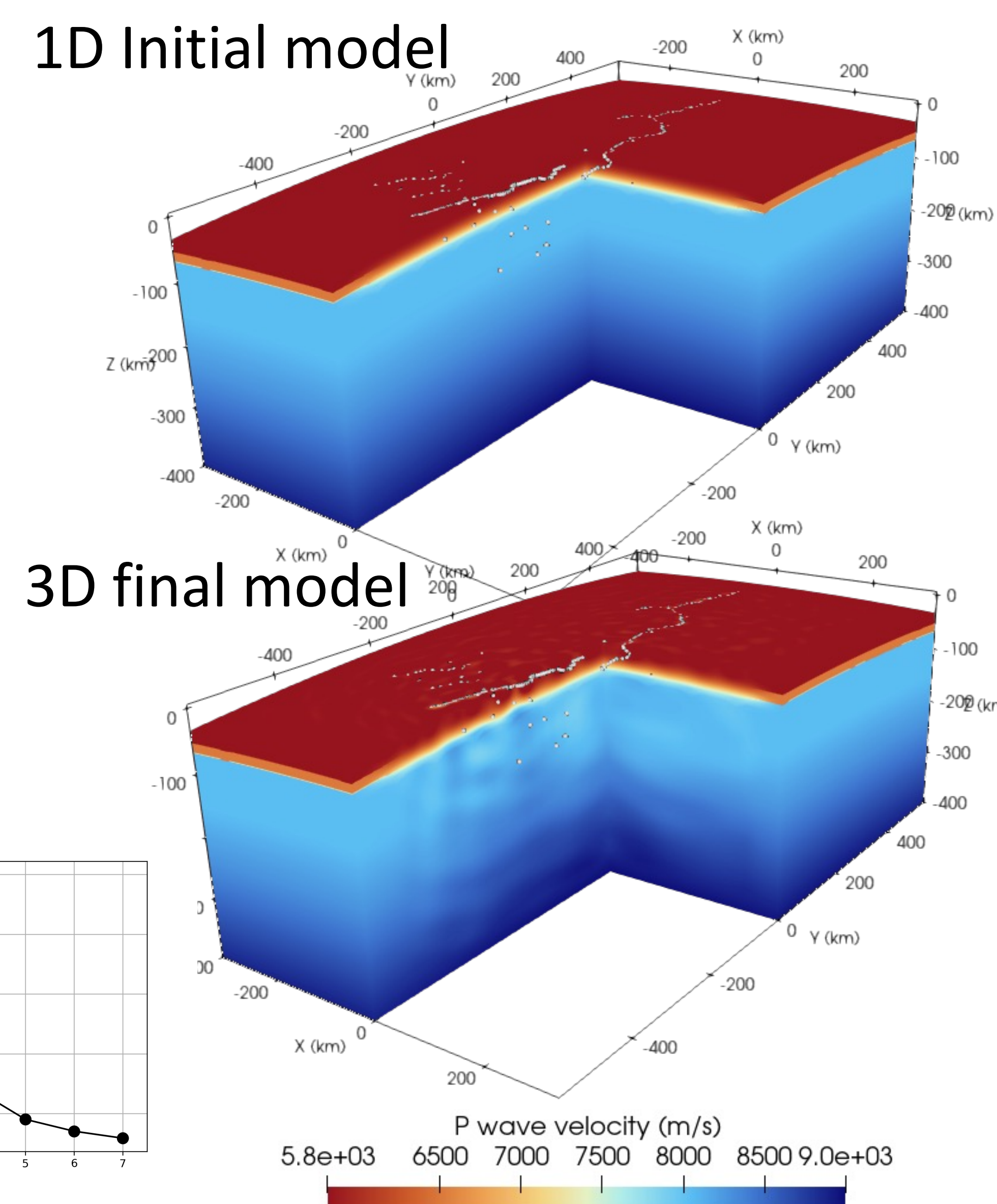


Sutures: boundaries between geological blocks. BNS: Bangong-Nujiang suture. INS: Indus-Yarlung suture.

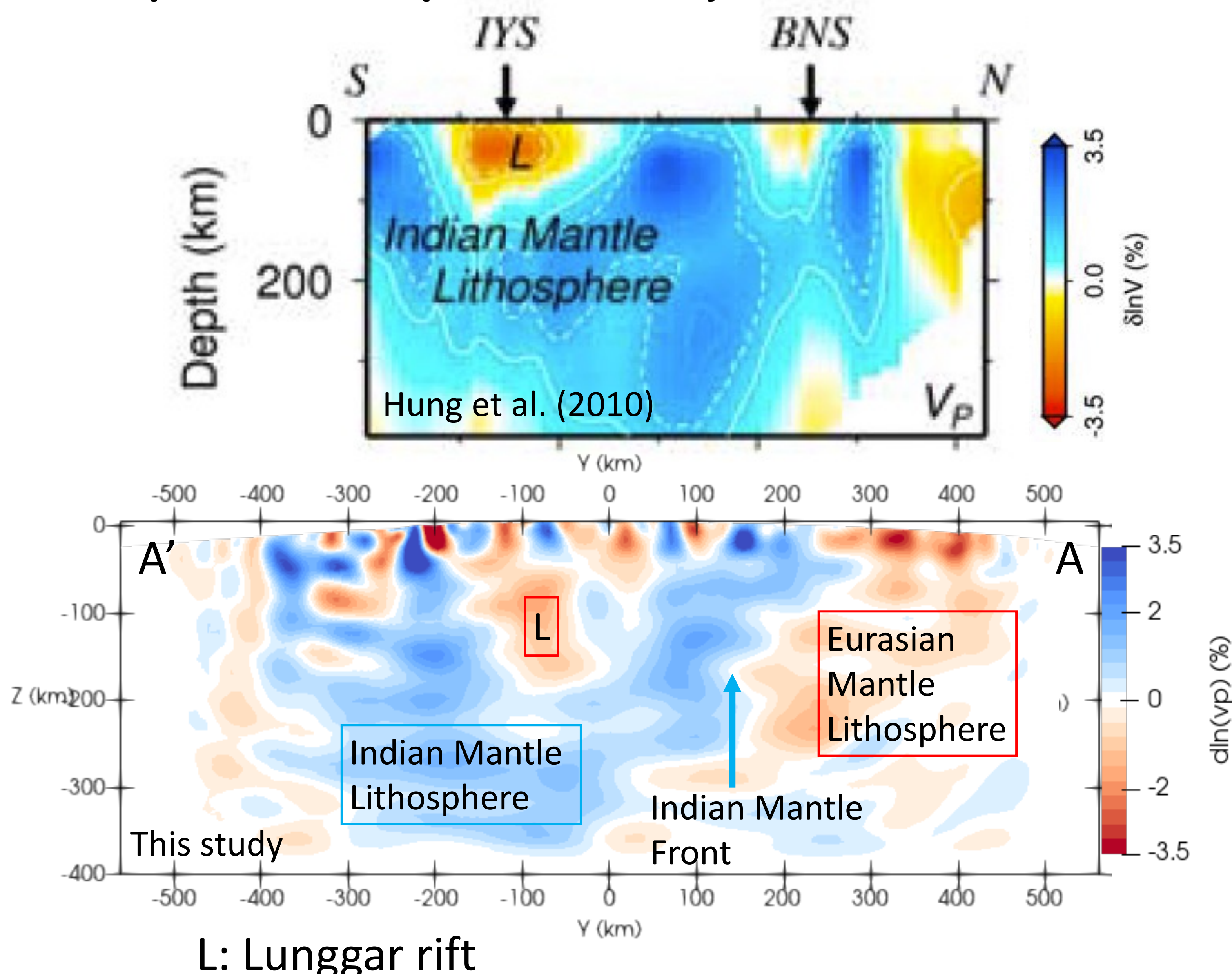
Workflow of the full-waveform inversion



Result of the iterative inversion



Comparison with previous study



Summary:

- We present the tomographic results of a full waveform inversion of teleseismic P-waves with frequencies up to 0.1 Hz from 20 earthquakes.
- The subduction front of Indian Plate near the Bangong-Nujiang suture is well illuminated and is dipping slightly southward.
- The Lunggar Rift has a root down to ~ 150 km which is deeper than the previous estimation (100 km, Hung et al. 2010).

Prospects:

- The presented seismic model provides a good reference for the upcoming inversions that incorporates seismic data with higher frequencies.
- We plan to include shear- as well as surface waves into the inversion to obtain reliable models of shear wave velocity and compressional-to-shear velocity ratio.