

Small-scale Shear Velocity Variance of the D'' Layer beneath the Indian-Eurasia Collision Zone

Guohui Li¹, Ling Bai¹, Jeroen Ritsema²

¹Key Laboratory of Continental Collision and Plateau Uplift, Institute of Tibetan Research, Chinese Academy of Sciences, Beijing, China

²Department of Earth and Environmental Science, University of Michigan, Ann Arbor, Michigan, USA

We studied the structure of the D'' layer beneath northern India using different travel time residuals of **S** and **ScS** phases recorded in waveforms from the Chinese Digital Seismic Network. These were generated by 9 shallow earthquakes from 2009 to 2018 with magnitudes larger than and/or equal to Mw 5.6 in the northern Indian Rise and the Gulf of Aden. We modeled the data using `specfem3d_globe` synthetics based on CRUST1.0 for the crust, S40RTS for the mantle, and AK135 for the lowermost 300 km of the mantle. High-velocity anomalies in D'' are dominant within the study area, particularly beneath the central part of northern India. We mapped two low-velocity zones beneath the westernmost and eastern portions of India. Our analysis indicates that the shear velocity varies by about 6 % over distances shorter than 300 km at the core-mantle boundary due to the thermochemical structure in D'' beneath the India-Eurasia subduction and collision zone.