



The Structure of the colliding plates beneath Tibet

R. Kind (1), J. Zhao (2), X. Yuan (1), Z. Zhang (2), and P. Kumar (3)

(1) GFZ Potsdam, Potsdam, Germany (kind@gfz-potsdam.de), (2) Chinese Academy of Sciences, Beijing, China, (3) National Geophysical Research Institute, Hyderabad, India

We present direct observations of the structure of the tectonic plates beneath the Tibetan plateau using seismic waves converted at discontinuities beneath Tibet. By assembling sections of P-S and S-P receiver function sections we map the lithosphere-asthenosphere boundary (LAB), the Moho and the 410 and 660 discontinuities along a number of profiles that traverse the plateau. We have identified a Tibetan plate that is sandwiched between the Asian and Indian plates. The seismic velocities in the Tibetan plate are slower than in the Indian and Asian plates, suggesting a significant temperature difference and hence different rheological behaviour of the Tibetan plate. In the westernmost part of Tibet, the Asian plate is underthrusting beneath the Indian plate, while in central and eastern Tibet the Indian plate is underthrusting beneath the Tibetan plate. There are also indications of Asian plate subduction in northern Tibet that are connected with a thickening of the Tibetan plate. There is no indication of subduction at the boundary between eastern Tibet and the Sichuan Basin.