

Public Abstract

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Title:Receiver Function study in Northeast Tibet and adjacent boundaries

We use receiver functions analysis and data from numerous teleseismic earthquakes to provide a detailed image of Moho depth and lithosphere-asthenosphere boundaries (LAB) in the northeastern Tibetan plateau and adjacent boundaries. About 500 events obtained from 61 broad-band stations were processed to extract receiver functions for each station. To demonstrate the agreement between P-wave and S-wave receiver function stacks, P-wave and S-wave receiver functions were examined for consistency. After determining the time-domain receiver functions, the Slant-Stacking technique and Common-conversion-point (CCP) method are used to estimate the crustal thickness, V_p/V_s ratio and Lithosphere-asthenosphere Boundaries in northeastern Tibet and adjacent blocks.

The average crustal thickness is about 50km for the entire study region. The deepest Moho is found along the Kunlun Fault zone in the northern Tibetan plateau. Furthermore, the presence of a double Moho phase in this region suggests that there is probably overlap of the Qaidam crust above the Kunlun crust. The crustal deformation is complex between the Kunlun fault and Haiyuan fault. We find a double Moho layer as ~35km and ~45km separately in the North Qilian suture zone, which might be the evidence of the subduction of an Early Paleozoic ocean plate beneath the North China Craton. The lack of data at Qilian Mountain make it difficult to tell whether the Moho depth is gradually decreasing through the northern boundary of the Tibetan plateau, or whether there is an abrupt offset. The Lithosphere-Asthenosphere boundary (LAB) for the western part of the study region is consistent with previous surface wave studies which found a lithospheric thickness of ~130km. But the eastern LAB is unclear, which has two major layers around 120km and 200km. The S-wave receiver functions has a lower resolution for the LAB, which might also indicate that the velocity gradient associated with the LAB occurs over a very large depth range (~50 km).