Geophysical Research Abstracts
Vol. 16, EGU2014-4877, 2014
EGU General Assembly 2014

Bulk crustal properties in NE Tibet and its implication for deformation model

Xiaobo Tian
(txb@mail.iggcas.ac.cn)

The crust beneath the northeastern (NE) Tibetan Plateau records far field effects of collision and convergence occurring between the Indian and Eurasian plates. A better structural understanding of the crust beneath NE Tibet can improve our understanding of Cenozoic deformation resulting from the India-Eurasia collision. Taking advantage of the relatively dense coverage in most areas in NE Tibet except for the Qaidam basin by regional seismic networks of Gansu and Qinghai Provinces, we isolate receiver functions from the teleseismic P wave data recorded from 2007 to 2009 and resolve the spatial distribution of crustal thickness and Vp/Vs ratio beneath NE Tibet from H-K scanning. Our results can be summarized as: (1) NE Tibet is characterized by $\sim$ 60-km-thick crust beneath the Nan Shan, Qilian Shan thrust belts and the Anyemaqen Shan, and 45-50 km-thick crust beneath the Tarim basin, the Alashan depression and the Ordos basin; the crust thins gradually from west to east in addition to the previously observed pronounced thinning from south to north; (2) the crust of NE Tibet exhibits a relatively lower Vp/Vs ratio of 1.72 than the north China block and a decrease in average crustal Vp/Vs ratio with increasing crustal thickness; and (3) the crustal thicknesses are less than the values predicted by the simple isostatic model of throughout Tibetan plateau in where the elevation is larger than 3.0 km. Our observations can be explained by the hypothesis that deformation occurring in NE Tibet is predominated by upper-crustal thickening or lower-crust extrusion.