



Focal depths and mechanisms of earthquakes in the Himalayan-Tibetan region

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Due to the collision between the Indian and Eurasian plates, the lithosphere of the Tibetan plateau has experienced strong deformation. The widespread of earthquakes with different focal depths and mechanisms reveal the complexity of the current deformation pattern. Here, we determine the focal depths and mechanisms of shallow earthquakes in the Himalayan-Tibetan region by modeling the waveforms of teleseismic P and its trailing near-surface reflections pP and sP.

We found that earthquakes with different tectonic backgrounds exhibit different features. The focal depths of all events we studied range between 4-49 km. Most earthquakes in the Tibet are shallower than 30 km, in agreement with the presence of the lower crustal flow observed in this region. Several events around the Himalay are deeper than 30 km, which are constrained to be within the low crust of subducting Indian plate. Thrust faulting earthquakes occurred primarily in northern Tibet and Himalaya, whereas strike-slip and normal faulting earthquakes were dominant in central and southern Tibet, respectively. These mechanisms are consistent with the predominantly NNW-SSE compression in the direction of current Himalayan-Tibetan continental collision.