

Present-day stress field in NW Himalaya and surrounding regions based on inversion of earthquake focal mechanisms

Stress field inversion is performed in NW Himalaya and surrounding regions on the basis of 584 earthquake focal mechanisms listed in the data bulletin of the International Seismological Centre (ISC) for the area between latitudes 25°-40° N and longitudes 65°-85° E. Earthquakes in the period of July 1974 to March 2018, with focal depths 10-248 km and magnitude range (M_w 4.7–7.9) have been selected and the inversion of all available solutions is applied to determine the best fitting stress tensors. Focal mechanism of most of the earthquakes indicates thrust faulting, which confirms northward under thrusting of the Indian Plate along the Main Boundary Thrust (MBT) and Main Central Thrust (MCT) system, and eastward under thrusting along the Burmese Arc. Fault-plane solutions indicate left-lateral motion along the Kirthar-Sulaiman Range and right-lateral motion along the Karakoram Fault, which are in agreement with the expected sense of lateral mass movement for the continental collision model. A predominant compressional stress regime in the NW Himalaya is represented by a thrust faulting mechanism along NNE-SSW and NNW-SSE trends in NW-India and Nepal regions and in Pakistan and Hindukush regions, respectively and by a normal faulting mechanism along WNW-ESE trend in Xizang and Kashmir regions.

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