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Estimation of earthquake hazard in the source zones along Indian plate boundary from GPS velocity derived strain rate and moment deficit

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The strain rate tensor across the Indian Plate boundary in Himalaya and part of north Burmese arc is calculated from the horizontal velocities of 1252 GPS stations and represented as continuous strain rate map. From the interpolated scalar strain field data, the areas displaying greater than 104 nstrain/yr are marked as 10 seismic source zones. The low b-values (0.53 to 0.73) and related seismo-tectonics indicate compressive nature of these zones. The high strain zones marked in the foothill Himalaya are areas of fault interactions between Himalayan Thrusts of Tertiary age with transverse older Proterozoic reactivated faults (an integral part of basement ridges on under-thrusted rigid Indian plate). Fault interaction is also prominent in EHS area and in Sagaing Fault, where faults from two different tectonic domains are interacting and getting activated by overall clockwise rotational mass movement around plate interface. For calculating seismic vulnerability, we have computed the geodetic moment rates from the measured geodetic strain rates by empirical formula within 15$\pm$2 Km seismic volume in these zones, and compared geodetic with seismic moment rate from earthquake catalogue of 100 years. From the moment deficit, the estimated magnitude of earthquake in 10 seismic source zones are calculated which ranges from 6.5 to 7.4. As per our analysis, the Arunachal Himalaya, Sagaing fault, EHS and Himachal Himalaya are posing high seismic threat with occurrence of shallow focus 7.1 Mw earthquake at any point of time