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Estimation of Source Parameters and their scaling relationship of small to moderate magnitude earthquakes for northeast India

Prosanta Kumar Khan¹ and Bandana Baruah²

¹Indian Institute of Technology (Indian School of Mines), Dhanbad, IIT (ISM), Dhanbad, Applied Geophysics, Dhanbad, India (khanprosanta1966@gmail.com)

²Seismo-Geodetic data receiving and Processing Centre, Central Head Quarters, Geological Survey of India, Kolkata - 700091, India

We investigate the source parameters of 87 local earthquakes ($3.5 \leq M_L \leq 5.0$) that occurred in West Brahmaputra basin and its neighbouring area, using body wave displacement spectra. Seismic moment, corner frequency, source dimension and static stress drop are estimated using a grid search method based on the model of circular source. The measured seismic moments, corner frequency and moment magnitude ranges from to N-m, 0.7 to 12.1 and 3.0 to 4.8, respectively. The average ratio of corner frequency of P - and S - waves is 2.21. The scaling relationship of seismic moment against corner frequency is also studied for various tectonics regimes separately. Median stress drop values of individual earthquake vary from ~ 0.1 to 38.5 MPa, with an average value of about ~ 6 MPa. Spatial variation of stress drop observed for different tectonic unit reveals a higher stress drop values associated with West Brahmaputra basin, Shillong-Mikir plateau and Indo-Myanmar subduction zone suggesting a higher stress accumulation that may increase the probability of higher magnitude earthquake. The empirical relationship between M_L and M_W scale is also derived for hazard assessment.