Evaluation of Seismicity in the Western and Central Himalayas

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Spatial distribution of seismicity has been assessed for the Western (30^0 – 35^0 N and 72^0 – 82^0 E) and for the Central (26^0 – 31^0 N, 81^0 – 89^0 E) Himalayas. The earthquakes magnitude ≥ 4.0 are selected for the period 1964-2004 from the International Seismological Centre (ISC) catalogues.

The frequency-magnitude relation (b-value) is calculated by the classical least square fit method as well as by the new alternative Kaltek method the least-squares fit approach is used for both the methods. The Fractal dimension is estimated using the correlation integral method. The total set of events was also used for estimating radiated energy in the region .

The large data set in the western and Central Himalayas made it possible to examine the b-value, fractal dimension (D), energy release in the region. The results are corroborative, and the zones of impending strong/large earthquakes are identified. The b-value maps have identified the higher stress zones, and the fractal dimension maps corroborated the stressed zones with fractal characteristics of the active fault. The energy release map, on the other hand, identified the zones of higher and lower energy release, thus indicating a the areas of future probable earthquakes.

The zones of low b – values in the Kangra and Uttarkashi areas indicate higher stress, and those with lower fractal dimension indicate greater clustering of epicenters. The low energy release in the Uttarkashi and Chamoli area is indicative for a probable earthquake in near future. In the central Himalaya region, the area in close proximity to the 1988 Nepal-Bihar earthquake epicenter zone, and is identified with low b, low D and low energy release.