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Fractal and multifractal characteristics of Indian Seismotectonic regions

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Recent advances in seismology and rock physics are very useful in understanding the available empirical laws in seismology. Such laws are interpreted from a fractal perspective, and earthquakes are viewed as a self organized critical phenomenon (SOC). Earthquakes occur as an energy dissipation process in earth's crust to which tectonic energy provides continuous input. As the crust gets self-organized into critical state of the crust, the temporal and spatial fractal structure emerges naturally. Power laws relations known in seismology may be considered as the expression of the critical state of the earth crust. SOC model for earthquakes, are able to explain the Gutenberg-Richter in size, the Omri's law of aftershcoks in time, the hypocentral distribution in space. Most fractal systems in nature are hetrogeneous. For such fractals, a unique fractal dimension is insufficient to characterize them and same differs depending upon the method used to estimate it. Fractals and multifractal characteristics are studied in the Himalayan and and other Indian seismotectonic regions. The correspondence between fractal dimension and other seismotectonic parameters are also studied in the region for understanding the seismic hazard of the region.

Keywords: Power law, Self organized Criticality, fractal, multifractal