GENERALIZED OMORI'S LA W FOR BLOCK SLIDINGS

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The distribution of earthquakes in space and time is a subject of great relevance in seismicity and tectonics, Some years ago, we have shown that a single solid block on a perturbed incline can generate power-law distributions of slidings or blockquakes similar to the Gutemberg-Richter law for earthquakes for a wide domain of perturbations and materials [Brito and Gomes, Phys, Lett A, 201(1995)38]. More recently, a detailed statistical analysis have shown that sequences of blockquakes present strong effects of persistence. In the present work we have reexamined long sequences of such blockquakes under several conditions and observed that the number of blockquakes with relative (normalized) magnitude L/L_0, where L_0 = maximum blockquake magnitude, distributes itself on the sequential space as a fractal whose support has the dimension $D(L/L_0) = D = m.\ln(L/L_0) + b$, with ill = - 0.19, and b = - 0,07, Thus, e. g. blockquakes with relative magnitude ½ (50% of the maximum energy) are distributed on a set of dimension 0.06, and blockquakes with relative magnitude 0,05 are distributed on a fractal of dimension 0,5, Furt1lemlore, the number of blockquakes observed with a relative magnitude larger than L/L_0 and a time resolution t obeys the power-law $n(>L, t) \sim t^{-D}$, We argue that this expression is a type of generalized Omori's law and it would be satisfied as well for sequences of real earthquakes for a single fault