



Precursory phenomena associated with large avalanches in the long-range connective sandpile (LRCS) model II: An implication to the relation between the b-value and the Hurst exponent

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We analyze the Hurst exponent H and a power-law exponent B obtained from frequency-size distributions of avalanche events in the long-range connective sandpile (LRCS) model and study the relation between those two parameters. The LRCS model is introduced by considering the random distant connection between two separated cells. We find that the B -values typically reduce prior to large avalanches while the H -values increase. Both parameters appear precursory phenomena prior to large avalanche events. Most importantly, we show that the LRCS model can demonstrate an interesting negative correlation between the B - and H -values, which has been frequently implied in observations and firstly verified in our present simulations.