Abstract Submitted
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Scale invariant avalanches: a critical confusion OSVANNY RAMOS, Laboratoire PMCN, University Lyon 1, 43 bd. du 11 novembre 1918, 69622 Villeurbanne, France — In the last decades considerable efforts have been devoted to understanding single events related to friction, fracture and unjamming transition, commonly denominated avalanches. However, in many different natural scenarios -from subcritical fracture to earthquake dynamics- these events are of all scales; a situation that has often been interpreted within the formalism of critical phenomena, and having as a relevant consequence the inherently unpredictability of scale-invariant avalanches. A revision of this interpretation which departs from standard ideas is presented here, resulting in [1]: (i) critical systems are not necessarily unpredictable; (ii) slowly driven systems evolving through power-law distributed avalanches are not necessarily critical; and (iii) scale-invariant avalanches are not necessarily unpredictable. Simple simulations and granular experiments [2] confirm the findings.

[1] O. Ramos, Scale invariant avalanches: a critical confusion; in B. Veress and J. Szigethy (eds.) Horizons in Earth Science Research. Vol. 3 (Nova Science Publishers) pp 157-188 (2011) arXiv:1104.4991v1.
[2] O. Ramos, E. Altshuler, and K. J. Måløy, Avalanche prediction in a self-organized pile of beads, Phys. Rev. Lett. 102, 078701 (2009).

Osvanny Ramos
Laboratoire PMCN, University Lyon 1,
43 bd. du 11 novembre 1918, 69622 Villeurbanne, France

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