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INTEREVENT TIME DISTRIBUTION IN AVALANCHE DYNAMICS.

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Physical systems characterized by stick-slip dynamics often display avalanches. Regardless of the diversity of their microscopic

structure, these systems are governed by a power-law distribution of avalanche size and duration. We focus instead on the

interevent times between avalanches and show that, unlike their size and duration, the distribution of interevent times is able to

distinguish different mechanical states of the system, characterized by different volume fractions or confining pressures. We

use experiments in granular media and numerical simulations of emulsions to show that systems having the same probability

distribution for avalanche size and duration can have different interevent time distributions. Remarkably, for large packing

ratios, these interevent time distributions coincide with those for earthquakes and are indirect evidence of large space-time

correlations in the system. Our results therefore indicate that interevent time statistics are more informative to characterize the

dynamics of avalanches.

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