Extreme statistics of avalanches near the depinning transition
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— Near the depinning transition, motion proceeds by avalanche fluctuations with power law distributed sizes and durations. We derive exact exponents and scaling functions for the statistics of maximum avalanche velocities in a mean field theory of the transition. We find a power law regime in the maximum velocity distribution with an exponent that agrees with the distribution of peak amplitudes observed in acoustic emission experiments of crystal plasticity. Our results should be applicable to the study of a number of systems considered to be in the mean field interface depinning universality class, ranging from magnets to earthquakes.

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