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Short time intermittency and long time plastic correlations in jammed systems ARKA ROY, CMU, CRAIG MALONEY, NEU — Using numerical simulations of model amorphous, frictionless, soft discs, we study the effect of strain rates ($\dot{\gamma}$) and volume fractions (ϕ) on the microscopic dynamics and plastic activity near, but above, the jamming point (ϕ_J). Well above ϕ_J, at slow shear rate, the system responds in a highly intermittent way, reminiscent of other dynamically critical systems with a power law distribution of energy dissipation rates. With increasing $\dot{\gamma}$ at fixed ϕ or letting $\phi \to \phi_J$ from above at a fixed rate, the intermittent behavior vanishes. All displacement distributions show non-Fickian behavior at short time crossing to Fickian behavior at longer times. Very surprisingly, the characteristic strain for that crossover is independent of ϕ. We also find that, despite the dramatic differences in the short time dynamics, the long time plastic rearrangements are essentially identical. Long-range spatial correlations in strain are cut off only by the size of the simulation cell.

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