

Abstract Submitted
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Scaling behavior of the yield stress near unjamming¹ SEAN RIDOUT, MAX LAVRETOVICH, ANDREA LIU, University of Pennsylvania — We study the yield strain in polydisperse, athermal packings of frictionless soft discs as the unjamming transition is approached. A recently introduced scaling theory of the jamming transition predicts that the yield stress should scale with the excess coordination number with a power $s_y \sim \Delta z^{5/2}$, and therefore with the pressure like $s_y \sim p^{5/4}$. Instead, we find $s_y \sim \Delta z^2$. We explain how this result can be reconciled with the scaling theory. We compare to the response of the system under oscillatory shear and the strain amplitude corresponding to the associated reversible to irreversible transition. The shear amplitude at the transition does not appear to scale strongly with the pressure, suggesting that yield and the reversible-irreversible transition are not related in an obvious way.

¹Simons Collaboration on “Cracking the Glass Problem”, 454945 to A.J.L.

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