Abstract Submitted
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**Universal signatures of plasticity in disordered solids**[1] ROBERT IVANCIC, University of Pennsylvania, EKIN CUBUK, Stanford University, SAMUEL SCHOENHOLZ , Google, DANIEL STRICKLAND, University of Pennsylvania, DANIEL GIANOLA, University of California, Santa Barbara, ANDREA LIU, University of Pennsylvania — We present aggregated data from the UPenn MRSEC IRG on the "Mechanics of Disordered Packings," obtained from experiments and simulations of disordered solids ranging from metallic glasses to granular packings. This data exhibits a remarkable commonality in the size of rearrangements at strains near or below the yield strain in systems spanning over 7 decades in particle size. Additionally, we find commonality in the magnitude of the macroscopic yield strain of disordered materials in systems spanning over 13 orders of magnitude in the Youngs modulus. To understand these commonalities, we use amachine learning approach to calculate a microscopic structural quantity, "softness," which correlates strongly with rearrangements. We find that there isemergent commonality in the spatial extent of softness correlations and in the response of softness to strain, rationalizing the commonality observed in the rearrangement size and yield strain.

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