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Shear Jamming in Particulate Media THIBAULT BERTRAND, COREY S. O'HERN, Yale University, MARK D. SHATTUCK, Benjamin Levich Institute, City College of the City University of New York — More than two decades ago, Liu and Nagel introduced the concept of jamming and proposed a phase diagram for the jamming transition as a function of applied shear stress, density, and temperature. Since then, numerous computational as well as experimental studies have underscored the usefulness of this concept in systems ranging from colloidal glasses to packings of granular materials. Recently, Bi et al. presented experimental results that suggested that jamming via isotropic compression can lead to different packings than those generated via shear. To investigate fundamental aspects of shear-induced jamming, we performed numerical simulations and theoretical analyses of frictionless and frictional particulate media undergoing simple shear. We are able to predict the form of the boundaries in the shear-jamming phase diagram and determine how they change with system size. We also study the relationship between the shear-jamming phase diagram and the fluctuations in the stress versus strain for packings undergoing continuous shear in the context of geometrical families of packings.

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