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Identifying shear transformation zones in amorphous solids via a virtual strain method MICHAEL FALK, Johns Hopkins University, SYLVAIN PATINET, ESPCI, Paris, France — One outstanding problem in the mechanical response of amorphous solids is the identification of flow defect sites, so called shear transformation zones (STZs), a priori in the structure. Many methods have been utilized in order to predict local STZ sites including short-range order, soft-mode analysis and machine learning. Here we directly probe local regions of the material via shear in order to detect nearby saddle points that can result in transformations. This non-perturbative method gives excellent correlation with global shear of the system. It also provides a means to cross-correlate the existence of such local transition pathways with other proposed diagnostics such as the soft-spot method of Manning and Liu. We use the information gained by this method to consider the coarse-graining necessary to connect atomistic methods to continuum theories.

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