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Shear jamming for highly strained granular materials JONATHAN BARES, ROBERT BERHINGER, Duke University — Bi et al. (Nature 2011) have shown that, if sheared, a granular material can jam even if its packing fraction (ϕ) is lower than the critical isotropic jamming point ϕ_J. They have introduced a new critical packing fraction value ϕ_S such that for $\phi_S < \phi < \phi_J$ the system jams if sheared. Nevertheless, the value of ϕ_S as a function of the shear profile or the strain necessary to observe jamming remain poorly understood because of the experimental complexity to access high strain without shear band. We present a novel 2D periodic shear apparatus made of 21 independent, aligned and mirrored glass rings. Each of ring can be moved independently which permits us to impose any desired shear profile. The circular geometry allows access to any strain value. The forces between grains are measured using reflective photoelasticity. This talk will present this novel apparatus and discuss inital results.

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