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Effect of friction on shear jamming[1] DONG WANG, Duke University, JIE REN, Merck & Co., JOSHUA DIJKSMAN, Wageningen University, ROBERT BEHRINGER, Duke University — Shear Jamming of granular materials was first found for systems of frictional disks, with a static friction coefficients $\mu_s \simeq 0.6$. Jamming by shear is obtained by starting from a zero-stress state with a packing fraction $\phi_S \leq \phi \leq \phi_J$ between ϕ_J (isotropic jamming) and a lowest ϕ_S for shear jamming. This phenomenon is associated with strong anisotropy in stress and the contact network in the form of "force chains," which are stabilized and/or enhanced by the presence of friction. The issue that we address experimentally is how reducing friction affects shear jamming. We use photoelastic disks that have been wrapped with Teflon, lowering the friction coefficient substantially from previous experiments. The Teflon-wrapped disks were placed in a well-studied 2D shear apparatus (Ren et al., PRL, **110**, 018302 (2013)), which provides uniform simple shear without generating shear bands. Shear jamming is still observed, but the difference $\phi_J - \phi_S$ is smaller than for higher friction particles. With Teflon-wrapped disks, we observe larger anisotropies compared to the previous experiment with higher friction particles at the same packing fraction, which indicates force chains tending to be straight in the low friction system.

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