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Self organization and shear-jamming in magnetic photoelastic particles MEREDITH COX, DONG WANG, Duke University, JONATHAN BARES, LMGC Montpellier, France, BOB BEHRINGER, Duke University — Many experimental studies of simple particles in granular systems have been conducted, but the behavior of complex particles in such systems has not been addressed. There has been a growing interest in functionalized microparticles, and the study of these complex particles may reveal interesting analogues between micro- and macroparticles. We perform experiments to investigate magnetic particles in a 2D granular material close to the jamming transition. We incrementally compress and shear photoelastic particles containing magnets and image the interparticle forces in each compression using a photoelastic technique. To track the orientation of individual particles, we draw UV-visible bars on each particle and image each compression of the system under ultraviolet light. We repeat the experimental procedure using varying ratios of magnetic to nonmagnetic particles from 0% magnetic to 100% magnetic. By using custom software to resolve particle deformations, we extract particle contact and pressure.

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