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Shear of ordinary, elongated and geometrically cohesive granular mixtures[1] DANIEL GYSBERS, SCOTT FRANKLIN, Rochester Institute of Technology — We report on shear of granular particles in an annular planar Couette shear. Particles are cut from acrylic sheet, are essentially incompressible, and constrained in a vertical stack in a thin gap between two concentric cylinders. The annular radius of curvature is much larger than the particle length scale, and so the experiment is quasi-2D and allows for arbitrarily large pure-shear strains. The shear is imposed from the top, with the confining pressure controlled by varying the compressive weight from above. Particle shapes include binary mixtures of disks, ellipses and spherocylinders, U-shaped particles with elliptical or spherical sides, and chiral particles that can be aligned with or against the shear. We investigate the extent of the shear band as a function of confining pressure and pile thickness, and track isolated non-circular particles to identify their impact on the shear of the surrounding ordinary granular material. We also investigate interactions between non-circular particles, looking for aggregation or other collective behaviors.

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