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Granular Flow in a 2D Couette-Taylor Experiment JEFFREY OLAFSEN, Department of Physics, Baylor University — The dynamics of granular materials pose interesting problems both in gravity and low-gravity environments due to their high dissipation in collisions and their propensity to jam. In addition, it has been shown that even moderate flows can achieve supersonic conditions within a granular medium.[1] A few thousand permeable spheres are motivated to flow in a 2D geometry via a magnetic field and then sheared mechanically at a boundary wall. The novel Couette-Taylor design of the apparatus with one soft boundary allows for shear flow in the 2D system to be studied in the absence of jamming. High-speed digital imaging and particle tracking software allow the system to be studied for a variety of flow speeds and shear rates at the boundary wall. The apparatus can also be used to study flow past an obstacle in analogy to a wind tunnel for granular flows.

[1]E. Rericha, C. Bizon, M. D. Shattuck, and H. Swinney, Phys. Rev. Lett., **88**, 014302 (2002).

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