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Shear flow in a vertically vibrated granular layer DAVID EGOLF, FRANCISCO VEGA REYES[1], J. CAMERON BOOTH, JEFFREY URBACH, Georgetown University — Couette flow has been an important testing ground for hydrodynamic descriptions of granular fluids. Typically the shearing of the medium is the only fluidizing force, so that the energy of the grains can not be changed independently from the shear rate. We present a series of experiments and molecular dynamics simulations of a horizontally sheared granular monolayer which is also heated by vertical vibration. We find that the experimental velocity profile is approximately exponential over a wide range of conditions. This behavior is reproduced in the simulation if friction with the vibrating plate is included. With frictionless plates, the velocity profile is approximately linear. We also present measurements of the profiles of other fundamental hydrodynamic variables.

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