

Abstract Submitted
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Discontinuous shear thickening and steady-state multiplicity in a granular suspension MORTON DENN, Benjamin Levich Institute, City College of New York, HENRI DE CAGNY, ZHONGCHENG PAN, DANIEL BONN, Van der Waals-Zeeman Institute, Institute of Physics, University of Amsterdam, RYOHEI SETO, ROMAIN MARI, JEFFREY MORRIS, Benjamin Levich Institute, City College of New York — A concentrated suspension of neutrally buoyant non-Brownian spheres sheared between concentric cylinders with an inner radius-to-gap ratio of 0.037 undergoes discontinuous shear thickening under shear rate control but passes through an S-shaped viscosity curve with multiple states under stress control. This behavior is well described by simulation results that incorporate particle-particle frictional forces into the hydrodynamic description and lead to an analytical interpolation relation between low friction and high friction states that predicts an S-shaped viscosity curve.

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