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Dissipation and Rheology of Sheared Soft-Core Frictionless Disks[1] DANIEL VÅGBERG, PETER OLSSON, Umeå University, Sweden, S. TEITEL, University of Rochester, Rochester NY 14627 — We use numerical simulations to investigate the effect of different dissipative models on the shearing rheology of massive soft-core frictionless disks in two dimensions. We show that the presence of Newtonian (overdamped) vs Bagnoldian (inertial) rheology is related to the formation of large connected clusters of disks, and that sharp transitions may exist between the two as system parameters vary. In the limit of strongly inelastic collisions, we find that rheological curves collapse to a well-defined limit when plotted against an appropriate dimensionless strain rate.

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