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Critical Scaling of Bagnold Rheology at the Jamming Transition of Frictionless Disks[1] STEPHEN TEITEL, University of Rochester, DANIEL VÅGBERG, Delft Univ of Tech, PETER OLSSON, Umeå University — We simulate shear-driven, frictionless, bidisperse disks in two dimensions, as a function of applied shear strain rate and packing fraction, for a model with a normal viscous dissipation that results in Bagnoldian rheology for all control parameters. Carrying out a critical scaling analysis of the pressure and shear stress near the jamming transition we find values of the critical exponents that disagree with theoretical predictions of Otsuki and Hayakawa[1] but are closer to more recent theoretical results by DeGiuli et al[2], as well as earlier simulations by Peyneau and Roux[3]. We find that it is essential to include leading corrections-to-scaling to arrive at self-consistent results.

[1] M. Otsuki and H. Hayakawa, Prog. Theor. Phys. 121, 647 (2009) and Phys. Rev. E 80, 011308 (2009)
[2] E. DeGiuli, G. Duřing, E. Lerner, and M. Wyart, Phys. Rev. E 91, 062206 (2015)
[3] P.-E. Peyneau and J.-N. Roux, Phys. Rev. E 78, 011307 (2008)

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