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Scaling of Rheology Near the Colloidal Jamming Transition¹ ZEXIN ZHANG, ANINDITA BASU, THOMAS HAXTON, ANDREA LIU, AR-JUN YODH, University of Pennsylvania — Recent simulations have proposed that the zero-temperature, zero-shear-stress jamming transition can be understood in the framework of critical phenomena, and thus can be described by various asymptotic scaling laws. We carry out rheology experiments in the vicinity of the jamming transition to study the scaling of flow properties of a bidisperse colloidal soft sphere system. We find, both below and above the jamming transition, a scaling collapse of the rheological data when the shear stress and shear rate are rescaled by proximity to the jamming transition. We extract critical scaling exponents and compared with simulations. C. S. O'Hern et al. Phys. Rev. E 68, 011306 (2003). P. Olsson, S. Teitel, Phys. Rev. Lett., 99, 178001 (2007). T. Hatano, arXiv:0803.2296v4 (2008), arXiv:0804.0477v2 (2008)

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