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Microfluidic Rheology of Soft Colloids near Jamming[1] KERSTIN NORDSTROM, E. VERNEUIL, P.E. ARRATIA, J.P. GOLLUB, D.J. DURIAN, University of Pennsylvania — The rheology near jamming of a suspension of soft colloidal spheres is studied using pressure-driven flow in a deep 25 μm wide microchannel. The system is composed of N-isopropylacrylamide (NIPA) microgel particles which exhibit thermoresponsive behavior; the suspension packing fraction is modified with a slight change in temperature. We use a force balance argument to infer the shear stress in the channel and use particle image velocimetry (PIV) to measure the strain rate. Stress vs. strain rate curves show clear non-Newtonian behavior below the jamming point and yield stress behavior above the jamming point. The data may be collapsed onto two branches but with different critical exponents than those obtained by Olsson and Teitel [1]. These results give credence to the idea that jamming is similar to a phase transition, but with interaction-dependent critical exponents. [1] Olsson and Teitel, PRL 2007

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