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Jamming in Microfluidic Devices CARLOS ORTIZ, KAREN DANIELS, ROBERT RIEHN, North Carolina State University — Systems of grains, colloids, and foams cease to flow, or jam, under poorly understood conditions. The phase transition common to these jamming phenomena depends on imposed load, temperature, and packing fraction. We study microfluidic jamming by flowing aqueous suspensions of sub-micron fluorescent polystyrene spheres through a microfluidic device. The device consists of a single wide channel followed by parallel rows of varying-size posts. These posts focus the bead flow into micron-sized channels, allowing us to control the particle volume fraction. Varying the particle size and the flow rate of the suspension allows us to indirectly control the importance of thermal effects and the applied load on the particles. Preliminary results show that bidisperse suspensions jam more readily at a lower flow rate, whereas monodisperse suspensions require ten times higher flow rates to jam. These results suggest that jamming transitions depend strongly on polydispersity.

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