Abstract Submitted
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Shear thickening regimes of non-Brownian suspensions CHRISTOPHER NESS, JIN SUN, University of Edinburgh — We propose a unifying regime map for shear flows of dense suspensions of non-Brownian spheres that captures the onsets of particle friction and particle inertia as distinct shear thickening mechanisms, while predicting quasistatic and soft particle rheology at high volume fractions and shear rates respectively. Discrete element method simulations reveal both mechanisms of shear thickening, and we show that they can be made to occur concurrently by careful manipulation of simulation parameters. Microstructural transitions associated with frictional shear thickening are presented, and we find very distinctive divergences of both the static and dynamic microstructure with respect to volume fraction in the thickened and non-thickened states.

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