

Abstract Submitted
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Constitutive model for time-dependent flows of shear-thickening suspensions¹ JURRIAAN GILLISSEN, University College London, CHRISTOPHER NESS, JOSEPH PETERSON, University of Cambridge, HELEN WILSON, University College London, MICHAEL CATES, University of Cambridge — We develop a tensorial constitutive model for dense, shear-thickening particle suspensions subjected to time-dependent flow. Our model combines a recently proposed evolution equation for the suspension microstructure in rate-independent materials with ideas developed previously to explain the steady flow of shear-thickening ones, whereby friction proliferates among compressive contacts at large particle stresses. We apply our model to shear reversal, and find good qualitative agreement with particle-level, discrete-element simulations whose results we also present.

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