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Local interactions and global rheology in disordered media ERIK WOLDHUIS, BRIAN TIGHE, Universiteit Leiden, KERSTIN NORDSTROM, DOUG DURIAN, Haverford College, JERRY GOLLUB, Haverford College, University of Pennsylvania, MARTIN VAN HECKE, Universiteit Leiden — We generalize our scaling model for the rheology of soft, frictionless repulsive spheres to include general local viscous and elastic interactions and come to a prediction of the effect on the global behavior of these local interactions. As our scaling model combines elastic and geometric ingredients and a power balance that depends on the local viscous law, we predict that the global rheology of disordered media depends on the details of the local interactions in a universal but non-trivial manner. We compare our predictions for the effect of different *elastic* interactions to recent experimental results on the interactions and rheology of NIPA particles.

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