

Abstract Submitted
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The flow and fracture of concentrated colloidal suspensions MIKE SMITH, University of Nottingham — Concentrated colloidal suspensions display dramatic rises in viscosity, leading to jamming and granulation, with increasing shear rate. It has been proposed that these effects result from inter particle friction, as lubrication forces are overcome. This suggests the jamming of concentrated colloidal suspensions should exhibit some shared phenomenology with macroscopic granular systems where friction leads to two different types of jammed state. Here we show that transient rheological measurements can be used to probe the processes of granulation in concentrated colloidal suspensions [1]. Our results support the idea that frictional contacts are created between jammed particles. The jamming behaviour displays two qualitatively different regimes separated by a critical strain rate with qualitatively different types of fracture/break up behaviour. In the lower strain rate regime, it is found that vibrations can be used to control jamming and granulation, resulting in a flowable fluid. [1] Nature Sci. Rep. 5:14175 (2015)

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