Rheology of very dense suspensions

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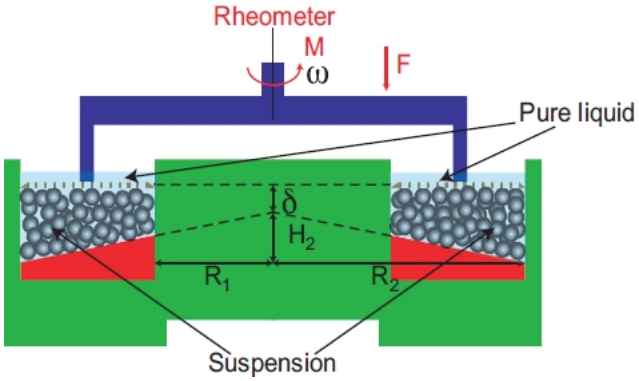
The rheology of suspensions of rigid particles close to the jamming transition is studied using a non conventional rheological method inspired by recent studies in dry granular media. A shear cell has been developed, in which the granular pressure is controlled, the volume fraction being free to adjust. Using this new setup, we show that suspensions can be described by a visco-plastic frictional rheology, providing a link with the rheology of dry granular media. This configuration also circumvents the divergences observed in volume fraction imposed rheology at the jamming transition and provides precise measurements of the constitutive equations very close to the jam- ming transition. The link between this point of view and the classical empirical models proposed for suspensions will be discussed.

This work is part of Francois Boyer's Phd.



References

[1] F. Boyer, E. Guazzelli, O. Pouliquen, Physical Review Letter **107**, 188301 (2011).

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