LadHyX Seminar – February 04, 14:00

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Flow of concentrated non brownian suspensions

Granular suspensions are suspensions of non-Brownian particles immersed in a Newtonian fluid at a high volume fraction, close to their jamming transition. The main challenge with these suspensions in the industry,e.g. when dealing with civil engineering materials such as cement pastes or foodstuff such as chocolate pastes , is to be able to handle suspensions that are as concentrated as possible.

In this talk, i will present experiments dealing with the characterization of the flow in this suspension and I will make the links between microscopic properties such as the friction coefficient, interactions between particles and the various rheological behavior of these suspensions. The interplay between forces, variation of the friction coefficient as a function of the load leads to Newtonian but also shear thinning and shear thickening behavior that may be rationalized using the Wyart and Cates model (PRL 2014). To reach this aim, we have developped in the laboratory various set up such as a tunig fork and local pressure sensor that will be displayed.

References

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- Chatté, Guillaume, Jean Comtet, Antoine Niguès, Lydéric Bocquet, Alessandro Siria, Guylaine Ducouret, François Lequeux, Nicolas Lenoir, Guillaume Ovarlez, and Annie Colin. "Shear thinning in non-Brownian suspensions." Soft matter 14, no. 6 (2018): 879-893.
- A new pressure sensor array for local normal stress measurement in complex fluids Gauthier Anaïs, Pruvost Mickaël, Gamache Olivier, Colin Annie arXiv:2010.04474 [physics.flu-dyn]