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Mixing particles and liquid in the preparation of a dough[1] ALBAN SAURET, University of California, Santa Barbara — Making pancake batter or bread dough requires mixing liquid, in this case, milk or water, with particles, here flour, ideally without forming lumps. The appearance of lumps, dry flour aggregates dispersed in the milk, is the main pitfall to be avoided by slowly and gradually adding the liquid. In all mixing processes, in the kitchen and beyond, the aim is to obtain a homogeneous mixture as quickly as possible and with the least effort. The blending of liquid in dispersed materials is also crucial in many industrial applications and environmental processes. This problem is reminiscent of the imbibition of a liquid in a fixed granular material, such as the liquid rise observed in a sugar cube. However, blending processes are more challenging to characterize as they involve an intricate coupling between the fluid flow and the granular dynamics. In this talk, I will present some of our recent work that aim to understand how a liquid imbibes moving grains, and how a jet of grains falling into a liquid bath is dispersed and can entrain air bubbles resulting in aggregates.

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