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Accelerated drop detachment in granular suspensions THIBAULT BERTRAND, CLAIRE BONNOIT, ERIC CLEMENT, ANKE LINDNER, PMMH-ESPCI, PMMH-ESPCI TEAM — We experimentally study the detachment of drops of granular suspensions using a density matched model suspension with varying volume fraction (Œ $\phi = 15\%$ to 55%) and grain diameter ($d = 20\mu m$ to $140\mu m$). We show that at the beginning of the detachment process, the suspensions behave as an effective fluid. The detachment dynamics in this regime can be entirely described by the shear viscosity of the suspension. At later stages of the detachment the dynamics become independent of the volume fraction and are found to be identical to the dynamics of the interstitial flÆuid. Surprisingly, visual observation reveals that at this stage particles are still present in the neck. We suspect rearrangements of particles to locally free the neck of grains, causing the observed dynamics. Close to the øfinal pinch off, the detachment of the suspensions is further accelerated, compared to the dynamics of pure interstitial flÆuid. This acceleration might be due to the fact that the neck diameter gets of the order of magnitude of the size of the grains and a continuous thinning of the liquid thread is not possible any more. The crossover between the different detachment regimes is function of the grain size and the initial volume fraction. We characterize the overall acceleration as a function of the grain size and volume fraction.

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