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Dynamic of particle-laden liquid sheet ALBAN SAURET, PIERRE JOP, ANTHONY TROGER, SVI, CNRS/Saint-Gobain — Many industrial processes, such as surface coating or liquid transport in tubes, involve liquid sheets or thin liquid films of suspensions. In these situations, the thickness of the liquid film becomes comparable to the particle size, which leads to unexpected dynamics. In addition, the classical constitutive rheological law cannot be applied as the continuum approximation is no longer valid. Here, we consider experimentally a transient free liquid sheet that expands radially. We characterize the influence of the particles on the shape of the liquid film as a function of time and the atomization process. We highlight that the presence of particles modifies the thickness and the stability of the liquid sheet. Our study suggests that the influence of particles through capillary effects can modify significantly the dynamics of processes that involve suspensions and particles confined in liquid films.

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