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Spreading Behavior of Single and Multiple Drops

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This paper describes experimental and numerical work relevant to the impact of single and multiple drops onto various solid substrates. The experimental methods are based on visualization techniques such as high speed cinematography and phase controlled ultra short snap shots of the impact process. The single drop spreading transients are modelled using the variational principle and a modified commercial code and they allow to obtain transient diameters, heights and profiles of the drop. Comparison between experimental and numerical results demonstrate quite fair agreement. The collision of two drops is then considered focusing on the case of one drop impinging onto another initially at rest. The preliminary experiments, performed at low enough velocities to avoid splashing, show that after coalescence of the two drops the swelling behavior of the liquid mass is very much alike that of a single drop. These results lead to a simple model able to describe the axisymmetric collision of drops and the extension of the model to other forms of coalescence is discussed.

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