

On the Dynamics of Droplet Impact and Solidification Process

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要旨

Droplet impact is a phenomenon which underlies many natural and industrial processes. For example impact of rain drops on leaves, or spray painting of automobiles. In many applications the impact might be accompanied with simultaneous solidification of the droplets. For example, in plasma spray coatings, molten metal or ceramic droplets impact a substrate and flatten and solidify.

This presentation is concerned with a description of the impact and solidification of droplets on flat or rough surfaces. A detailed mathematical model of impact and solidification is described and its results are compared against experiments. A new methodology will be presented for accurately calculating normals and curvature of an interface, in which the interface unit normals are advected along with what ever function represents the interface, and curvatures are calculated directly from these advected normals. The new method yields interface geometry more accurately.

