

## **An Experimental Investigation on the Droplet Behavior Impacting a Hot Surface above the Leidenfrost Temperature**

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**Abstract :** An appropriate model to predict the size of the droplets resulting from the break-up with the structures will help in a better understanding and modeling of the two-phase flow calculations in the simulation of a reactor core loss-of-coolant accident (LOCA). A droplet behavior impacting on a hot surface above the Leidenfrost temperature was investigated. Droplets of known size and velocity were impacted to an inclined plate of hot temperature, and the behavior of the droplets was observed by a high-speed camera. It was found that for droplets of Weber number higher than a certain value, the higher the Weber number of the droplet the smaller the secondary droplets. The COBRA-TF model over-predicted the measured secondary droplet sizes obtained by the present experiment. A simple model for the secondary droplet size was proposed using the mass conservation equation. The maximum spreading diameter of the droplets was also compared to previous correlations and a fairly good agreement was found. A better prediction of the heat transfer in the case of LOCA can be obtained with the presented model.

**Keywords :** break-up, droplet, impact, inclined hot plate, Leidenfrost temperature, LOCA

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