

Abstract Submitted
for the DFD15 Meeting of
The American Physical Society

Spreading behavior of a drop upon impact onto a moving surface HAMED ALMOHAMMADI, ALIDAD AMIRFAZLI, Department of Mechanical Engineering, York University, Toronto, ON, Canada, - TEAM — Drop impact on a moving surface is of interest in many applications like ink-jet printing and coating. Aside from the usual drop deposition, splashing and rebound regimes, for drop impact onto a moving surface, new regimes such as asymmetric spreading, and tail-lift-off were also seen. A systematic investigation was performed to understand asymmetric spreading. We present an experimental study for water drops (dia. 2.5 mm) impacting and then spreading on a moving surface. A quantitative analysis of the asymmetric spreading was done for a combination of different velocities for surface ($V_s = 0$ to 10.2 m/s) and drop ($V_d = 0.5$ to 3.4 m/s). Results show that the edges of drop acting differently, if it spreads in the same (downstream) or opposite (Upstream) directions of surface motion. Upon impact the drop apex remains stationary, while the downstream lamella either spreads or moves at V_s . Upstream lamella spreads at lower velocity on the moving surface compared to stationary case. Using hydrophilic and hydrophobic surfaces, the effect of the wettability on the lamella shape was also studied. An empirical model was developed to describe the lamella shape which is functions of V_d , V_s and surface wettability for the spreading regime.

Hamed Almohammadi
York University, Toronto, ON, Canada

Date submitted: 01 Aug 2015

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