

Abstract Submitted
for the DFD17 Meeting of
The American Physical Society

High-speed micro-droplet impact on a super-heated surface¹

YUTA FUJITA, Tokyo Univ of Agri Tech, TUAN TRAN, Nanyang Technological Univ, YOSHIYUKI TAGAWA, Tokyo Univ of Agri Tech, YANBO XIE, Univ of Twente, CHAO SUN, Tsinghua Univ, DETLEF LOHSE, Univ of Twente — In this study, we experimentally show that the condition for micro-droplets to splash depends on the temperature of the surface on which the droplets impact. We vary droplet diameter (30~120 μm) and surface temperature (20~500°C). For an impacting droplet, splashing becomes possible for high surface temperature $T > 160^\circ\text{C}$ and Weber number $We > 100$. In contrast, at low surface temperature $T < 140^\circ\text{C}$, no splash was observed up to the maximum Weber number in our experiments, i.e. $We \sim 7,000$. Our results show that the criteria for splashing of micro-droplets may be different from those of milli-sized droplets, in particular when the impacted surface is heated.

¹This work was supported by JSPS KAKENHI Grant Number 16K14166

Yuta Fujita
Tokyo Univ of Agri
Tech

Date submitted: 31 Jul 2017

Electronic form version 1.4