Abstract Submitted
for the DFD15 Meeting of
The American Physical Society

Superhydrophobic-like tunable droplet bouncing on slippery liquid interfaces CHONGLEI HAO, ZUANKAI WANG, City Univ of Hong Kong — Droplet impacting on solid or liquid interfaces is a ubiquitous phenomenon in nature. Although complete rebound of droplets is widely observed on superhydrophobic surfaces, the bouncing of droplets on liquid is usually vulnerable due to easy collapse of entrapped air pocket underneath the impinging droplet. Here, we report a superhydrophobic-like bouncing regime on thin liquid film, characterized by the contact time, the spreading dynamics, and the restitution coefficient independent of underlying liquid film. Through experimental exploration and theoretical analysis, we demonstrate that the manifestation of such a superhydrophobic-like bouncing necessitates an intricate interplay between the Weber number, the thickness and viscosity of liquid film. Such insights allow us to tune the droplet behaviors in a well-controlled fashion. We anticipate that the combination of superhydrophobic-like bouncing with inherent advantages of emerging slippery liquid interfaces will find a wide range of applications.

Chonglei Hao
City Univ of Hong Kong

Date submitted: 27 Jul 2015 Electronic form version 1.4