Abstract Submitted
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Impulse-driven drop HAMED HABIBI, ROUSLAN KRECHETNIKOV, University of Alberta — Drop deformation and disintegration regimes have been studied in many contexts ranging from an impact on a solid surface or a liquid layer of varying thickness to an aerodynamic shock wave propagating in air and hitting a suspended liquid drop. As a counterpart, we study deformation and disintegration of a sessile drop on a stiff membrane in the context of an impulsive acceleration. The key objectives here are to elucidate the effects of viscosity, surface tension, and wetting on the drop deformation and disintegration as well as to convey the physical mechanisms behind the observed transient responses of the initially static drop of controlled shape and size. Hence, the significant amount of experimental data – used to map the possible drop morphological changes along with the transitions between them: crown height, radius, and instability wavelength in the crown regimes; drop detachment and disintegration times as well as probability density functions of the secondary droplets in the disintegration regimes – is interpreted with phenomenological models, scalings, and estimates highlighting the rich multiscale physics of the impulse-driven drop phenomena.

Rouslan Krechetnikov
University of Alberta

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