

Abstract Submitted
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Dynamics of a solid sphere bouncing on or penetrating through a liquid-air interface SEONG JIN KIM, SUNGHWAN JUNG, Virginia Tech, SUNGYON LEE, Texas A&M University — In this study, we investigate the dynamics of a solid particle moving from liquid to air through a liquid-air interface. The experimental setup consists of an air-piston system that shoots a solid particle into water towards the free surface from below. Experimental results indicate that the particle either penetrates or bounces back depending on the particle size, impact speed, and surface tension. In particular, the particle needs to overcome the resistive interfacial forces in order to penetrate through the liquid-air interface. This transition from bouncing to penetration regimes is captured theoretically by conducting a simple force balance and is further compared with experiments.

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