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Role of cavitation in high-speed droplet impact problems TOMOKI KONDO, KEITA ANDO, Keio University — High-speed droplet impact is found in physical cleaning using liquid jets, but its mechanisms for particle removal from target surfaces are yet unclear. In this study, we explore the possibility of having cavitation inside the droplet. The pressure evolution within a droplet colliding with a flat surface of deformable materials is determined by multicomponent Euler equations. Dynamics of cavitation bubbles heterogeneously nucleated from preexisting nuclei are determined from Rayleigh-Plesset calculations according to the pressure evolution within the droplet in one-way-coupling manner. The simulation shows that cavitation indeed occurs due to tension that arises from the water hammer shock reflection at the droplet interface. The role of cavitation including pressure emission from its collapse is to be discussed based on the one-way-coupling computations.

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