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Passive Cavity Deflation after Water Entry EMMA FRALEY, RAFSAN RABBI, Utah State University, KELLI HENDRICKSON, Massachusetts Institute of Technology, TADD TRUSCOTT, Utah State University — Under specific impact conditions, objects form cavities when they enter a quiescent surface and persist for an extended time. The ability to quickly deflate or remove the cavity is important for naval, acoustic and marine applications. Herein, we propose a passive cavity deflation mechanism made of a hollow tube attached to a sphere with radial holes near the base, called the Kiara tube. We perform a series of experiments varying tube length, radial hole area and drop height to assess what factors influence cavity deflation and utilize high-speed cameras and image processing to quantify the cavity deflation. In general, tube lengths less than a critical length provide no deflation while larger tube lengths provide a consistent deflation rate. We will also discuss the effects of additional factors such as drop height, radial hole area, surface coatings, and forces as they relate to the cavity deflation rate.

Tadd Truscott
Utah State University

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