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Double sphere water entry: side by side CHASE MORTENSEN, RAFSAN RABBI, TADD TRUSCOTT, Utah State University — Objects with a rough surface texture can create underwater cylindrical air cavities in the wake of water entry. These cavities greatly influence the descent trajectory, structural integrity, and drag force of the body. These properties along with different cavity characteristics have been studied at length for the case of a single sphere. An interesting extension to these studies is the simultaneous water entry of multiple roughened objects next to one another. We performed a series of experiments using two hydrophobic spheres at varied horizontal distances from each other, dropped in free-fall from a height range of 5 - 170 cm onto a water pool, and studied the evolution of the cavities that are created. In general, a simultaneous two-sphere impact on water introduces interactive flow effects, greatly influencing parameters such as cavity pinch-off time, cavity diameter, and the Worthington jet. We also report on a critical non-dimensional horizontal distance of influence beyond which the cavities formed by the two spheres have no effect on one another.

Tadd Truscott
Utah State Univ

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