

Abstract Submitted
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Holy Balls!: Part Deux JESSE BELDEN, MICHAEL JANDRON, Naval Undersea Warfare Center, TADD TRUSCOTT, Brigham Young University — A Waboba[®] (WATER BOUNCING BALL) demonstrates remarkable water skipping behavior, even at relatively large impact angles. The highly compliant nature of these elastic spheres results in significant deformation into a disk-like shape upon impact. The increased wetted area and force coefficient generates a large hydrodynamic force that more readily lifts the ball off the water surface. However, elasticity introduces some surprising phenomena, such as material waves that propagate on the sphere and interact with the water cavity. Depending upon impact conditions, material waves may propagate in various directions combining to create multiple modes of deformation and complicated fluid-structure interactions. Furthermore, the timescales of deformation and wave propagation depend on the material properties and impact conditions. In this talk, we will discuss skipping regimes in terms of impact parameters and material properties and relate failed skipping behavior to the structure-fluid interaction caused by deformation. The critical timescales for deformation, wave propagation and collision will be related to the relevant physical parameters of the problem.

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