

Abstract Submitted
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Harnessing sloshing as a passive dampener¹ TAYLOR KILLIAN, ROBERT KLAUS, TADD TRUSCOTT, Brigham Young University — This study investigates the impact dynamics of hollow elastic spheres partially filled with fluid, similar to roller hockey balls. Unlike an empty elastic ball, the fluid mitigates some of the rebound through an impulse driven exchange of energy wherein the fluid is forced into a jet inside the ball. Images gathered through experimentation show that the fluid reacts more quickly to the impact than the ball, which decouples the two masses (fluid and ball), imparts energy to the fluid, and removes rebound energy from the ball. The experimental results are compared to an energy method where energy is transferred from the external motion of the ball, to the internal flow of the fluid. Results suggest that while the internal liquid affects the fluid motion, the rebound characteristics of the ball are uniform for a given amount of fluid. Implications of this work on an analog to the roller hockey ball is a potential use of similar passive dampening systems in sports technology and marine engineering.

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