

Abstract Submitted  
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**Cavitation you can hold in your hand... for a moment** DAVID JESSE DAILY, Electronic Consulting Services, JONATHON PENDLEBURY, Brigham Young University, KENNETH LANGLEY, Hill Air Force Base, TADD TRUSCOTT, Brigham Young University — In a popular party trick a glass bottle is filled with water and firmly struck at the top, breaking the bottle with nothing but bare hands. We present evidence that this trick is caused by cavitation formed by the acceleration of the fluid. Traditional velocity based methods for determining cavity formation do not successfully predict cavitation onset, however, a dimensionless cavitation equation derived from the Navier-Stokes equation predicts cavitation as a function of pressure head and acceleration. Our experiments utilized accelerometers and high-speed photography to observe cavitation with good agreement between experiments and predictions. Elucidating the onset of cavitation based on these simple parameters will help those who attempt this trick appreciate the physical complexity of this phenomenon and improve their bottle breaking skills.

Tadd Truscott  
Brigham Young University

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