

Abstract Submitted
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A demonstration of acoustic shock wave propagation MICHAEL B. MUHLESTEIN, KENT L. GEE, JEFFREY H. MACEDONE, Brigham Young University — High-amplitude sound requires nonlinear theory in order to properly describe waveform propagation. A common chemistry demonstration, an exploding gas-filled balloon, has been found to be a simple and effective way to verify nonlinear evolution predicted by the Earnshaw solution to the Burgers equation coupled with weak-shock theory. Measurements of acetylene- oxygen balloon explosions have been performed in an anechoic chamber with microphones placed at various distances from the balloon. Predicted and measured pressure levels show significant positive correlation. The results show that use of these demonstrations can be extended beyond introductory chemistry classes into graduate courses in physical acoustics.

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