

Abstract Submitted
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High-speed visualization of underwater explosions and shock wave behavior MATTHEW MADALIS, MICHAEL HARGATHER, GARY SETTLES, Penn State — Underwater explosions differ in several ways from those traditionally observed in air. They create a high-temperature, high-pressure gas bubble in addition to a shock wave, whereas in air a fireball and a shock wave form. Various underwater shock wave phenomena are considered here, including shock interaction with a free boundary, shock reflection from a blunt object, and shock propagation through a thin wall. Shock speed is also measured optically. Observation of these underwater phenomena is provided by simple shadowgraph or schlieren methods coupled with a Photron APX-RS high-speed digital camera. Small explosive charges on the order of 1 gram are suspended and detonated in a transparent-walled water tank with a liquid capacity of approximately 0.15 cubic meter (40 gallons).

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