Abstract Submitted
for the DFD13 Meeting of
The American Physical Society

Shock wave reflections in a liquid filled thin tube SHOTA YAMAMOTO, YOSHIYUKI TAGAWA, MASAHARU KAMEDA, Tokyo University of Agriculture and Technology — We investigate a behavior of an underwater shock wave in a thin glass tube using an ultra high-speed camera up to 10^7 frames per second. We here focus on the pressure of the reflected shock wave at interfaces (water-glass wall / water-air). A shock wave is visualized using the Background Oriented Schlieren (BOS) technique. We measure the time evolution of the shock front position and estimate the shock velocity, pressure, and internal energy as a function of the distance from the shock center. At the water-wall interface the reflected shock pressure is lower than the incident shock pressure, which agrees well with the theoretical estimation for an acoustic pressure wave. The reflected pressure at the air-water interface is much lower than the incident shock, indicating that the shape of the air-water interface may affect this reduction of the reflected pressure.

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Date submitted: 29 Jul 2013 Electronic form version 1.4