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Shock interaction with a growing or collapsing bubble[1] MICHAEL CALVISI, ANDREW SZERI, University of California, Berkeley, GEORGII SANKIN, PEI ZHONG, Duke University, JOHN BLAKE, University of Birmingham (UK) — The nonspherical collapse of a laser-initiated bubble due to interaction with a lithotripter shock wave (LSW) is modeled, and the results compared to experimental data of Sankin et al. PRL (2005). Interaction with the shock causes an initially spherical, expanding or collapsing bubble to develop a jet along the shock propagation direction. Upon impact with the distal side of the bubble, the rapidly moving jet generates high pressures and can cause cavitation damage to nearby surfaces. The intensity of this impact depends strongly on the arrival time of the shock relative to the phase of the expansion or collapse of the laser-generated bubble. The calculation of Kelvin impulse and kinetic energy of the jet yields new insight into the physics of jetting as a function of this time delay.

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