**Optical shockwave pressure measurements at the erosion site of single bubbles**

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Cavitation erosion is produced under certain geometric conditions when during the collapse of a single bubble a self-focusing of shockwaves amplifies the collapse. Then, one bubble collapse is sufficient to produce visible damage on even the hardest metal surfaces. The pressures during the final stage of this intense collapse at the solid material surface however are currently unknown. Conventional measurements using hydrophones are not possible due to bandwidth, geometric constraints, and possible damage to equipment, while also disturbing the bubble collapse at relevant distances from it. Here, we non-invasively measure the pressure of the shockwaves emitted from the erosive collapse of single laser induced bubbles in the direct vicinity of a few micrometers to the collapse site. We use high-speed shadowgraphy of the shockwave front and bursts of laser illumination to achieve multiple exposures of a single shockwave front per frame, resulting in precise measurements of 2D shockwave velocity development in time. We account for diffraction of the initially non-spherical shockwave front using an acoustic wave equation and measure the shock velocity from the imaging. With an adequate equation of state of water, the local shock pressures are found.

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