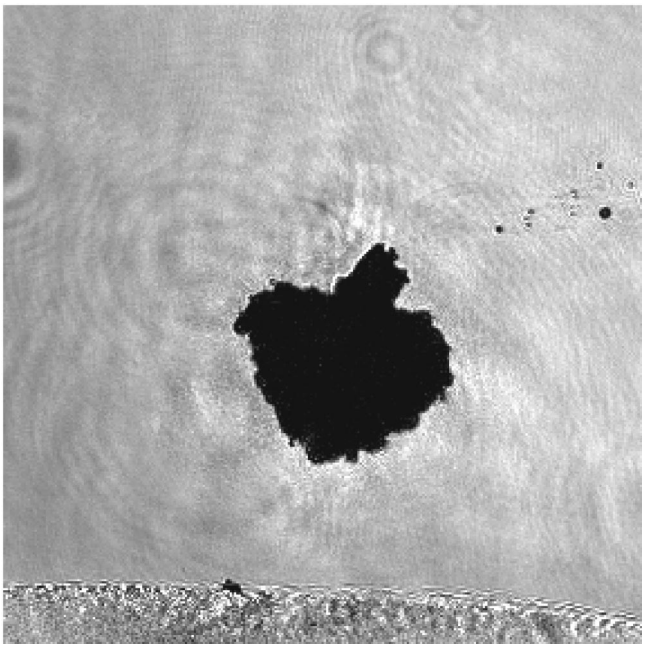

FIG. 1. Leaf shape for bubble collapse in toluene.

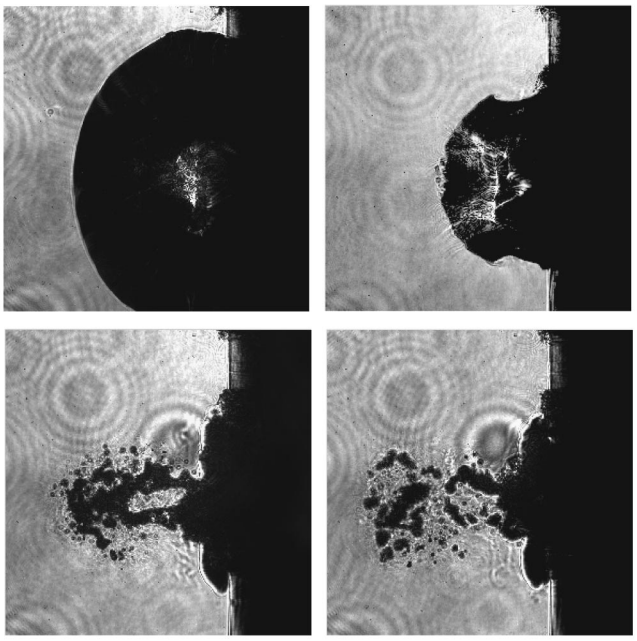

FIG. 2. Time series for collapse in CS_2. The delay times are 50, 70, 95, and 100 μs.

Bubble Dynamics at Boundaries at Microsecond Time Scales

Submitted by
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These pictures follow the collapse and breakup of energetic bubbles formed in hydrocarbons. The bubbles are created using optical breakdown of the liquid generated with a pulsed YAG laser. A second laser pulse from an OPO laser following at a delay is used to create a shadowgraph on a charge coupled device array. The nature of the collapse is sensitive to the liquid used to record the picture. Figure 2 follows the collapse of a bubble formed in carbon disulfide near a vertical wall. Figure 3 shows bubbles in toluene containing a weakly absorbing dye near a horizontal wall. The bubble moves toward the wall against the pull of buoyancy. The translation of the bubbles is due to pressure gradients induced by the presence of the walls during the collapse. The progress of the fragmentation of the bubbles is a strong function of the target medium and the location and orientation of the wall. In the upper group collapse is predominantly transverse to the wall. In the lower group it is predominantly normal to it.

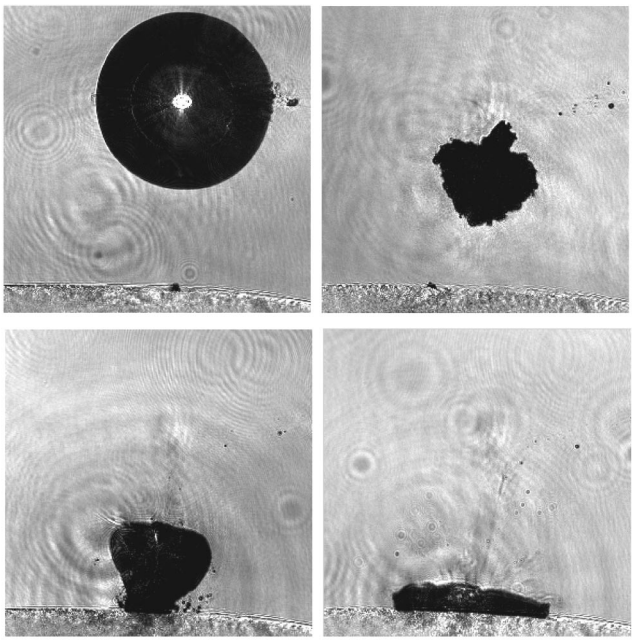

FIG. 3. Time series for collapse in toluene. The delay times are 5, 40, 65, and 80 μs.

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