

Supplementary Material

Vortex ring formation from the interaction of a cavitation bubble with a confined air bubble: experiments and a timing criterion

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Movie 1: This movie highlights the behavior of the cavitation bubble interacting with the confined air bubble in Case 1 ($\mathcal{H} = 0.44$ and $\mathcal{B} = 0.37$), as defined in the main text. This movie shows the impact of the liquid column with the far boundary of the collapsing bubble at $2800 \mu\text{s}$ and the subsequent formation of a vortex ring.

Movie 2: This movie illustrates the interaction between the cavitation bubble and the confined air bubble for Case 2 ($\mathcal{H} = 0.72$ and $\mathcal{B} = 0.37$), as defined in the main text. This movie shows the impact of the liquid column near the end of the cavitation bubble collapse, resulting in no vortex ring formation.

Movie 3: This movie depicts the interaction between the cavitation bubble and the confined air bubble for Case 3 ($\mathcal{H} = 0.24$ and $\mathcal{B} = 0.63$), as described in the main text. This movie depicts the impact of the expanding air bubble on the far boundary of the cavitation bubble at the onset of collapse. Such an interaction leads to weak roll-up, resulting in no vortex ring formation.