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Dynamic buckling of collapsing viscous bubbles ALEXANDROS ORATIS, Boston University, JOHN BUSH, Massachusetts Institute of Technology, HOWARD STONE, Princeton University, JAMES BIRD, Boston University — When air bubbles rise to the surface of a liquid, they create a thin-film dome that eventually ruptures. In liquids with relatively low viscosity, film rupture is followed by rapid film retraction dominated by surface tension and inertia, and typically occurs over a period of milliseconds. In liquids with relatively high viscosity, viscous dissipation slows the film retraction sufficiently that the bubble collapses. As it does so, radial wrinkles appear on its surface. Previous investigations have concluded that gravity is responsible for both the bubble collapse and the wrinkling instability. We here demonstrate that experiments yield the same radial wrinkle pattern independent of the bubble orientation relative to gravity. We develop an alternative model for the wrinkles in which surface tension initiates a dynamic buckling instability.

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