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The equilibrium shape of bubbles on curved interfaces[1] JAMES BIRD, DANIEL POE, PETER WALLS, Boston University — The equilibrium shape for a bubble resting at a free surface depends on a balance of hydrostatic and capillary forces, with the smallest bubbles approximating a sphere and a hemisphere for the largest. This shape has been shown to be important to several processes ranging from gas transfer across the thin film cap to the production of jet droplets. Past works calculating the equilibrium shape assume that the interface is flat. However, there are instances where the curvature of the boundary may be comparable to the bubble itself. For example, a bubble bursting on the surface of a rain droplet. Here we relax the assumption of a flat interface and extend the classic bubble shape calculations to account for a curved interface boundary. An understanding of the extent of this deformation and the precise equilibrium bubble shape is important to applications in fields ranging from air-sea exchange to combustion dynamics.

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