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The smallest jet drops produced by bursting bubbles[1] FREDERIK BRASZ, CASEY BARTLETT, PETER WALLS, ELENA FLYNN, JAMES BIRD, Boston University — Aerosol droplets are produced from the breakup of jets formed when small air bubbles burst at an air-liquid interface. These jet drops transfer sea salt and organic matter from the oceans to the atmosphere, where they act as cloud condensation nuclei and can spread pathogens. The smallest aerosols persist the longest in the air and advect the furthest from their source, but because they are too small to be observed directly, little is known about what size ocean bubbles create them or how their formation depends on seawater properties. We show, both experimentally and numerically, that the minimum size of primary jet drops is set by the interplay between viscous and inertial-capillary forces and is significantly smaller than previous estimates. We find that viscous stresses modify both the shape of the collapsing bubble and the breakup of the resulting jet, leading to a non-monotonic size relationship between the bubble and primary jet drop.

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