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The dynamics of corona formation ROBERTO ZAMORA, WENDY ZHANG, University of Chicago — Experiments show that the corona, the thin liquid sheet ejected by liquid impact, can have a variety of shapes, ranging from a concave bowl to an open tube with nearly straight wall and even a closed bell. Here we examine the formation process via a simple model that tracks how the centerline of the ejected sheet evolves over time. We restrict to axisymmetric shapes. Viscous dissipation and airflow effects are assumed to be negligible. During impact, the sheet-ejection location expands radially and the ejection speed decreases over time. To account for these effects in a simple way, we assume that the kinetic energy of the impact dominates over the surface energy and that the projectile is a sphere. As a result, the ejection location $R_J(t)$ expands as $\sqrt{a_0 U_0 t}$, where a_0 is the projectile radius, U_0 the impact speed and t the time elapsed since impact. The ejection speed is simply dR_J/dt. Our calculation shows that, as a result of this kinematic condition, a curved profile is generated even without surface tension. More intricate shapes are possible when surface tension effects are included.

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