Supplementary Material for Gliding on a layer of air: Impact of a large-viscosity drop on a liquid film

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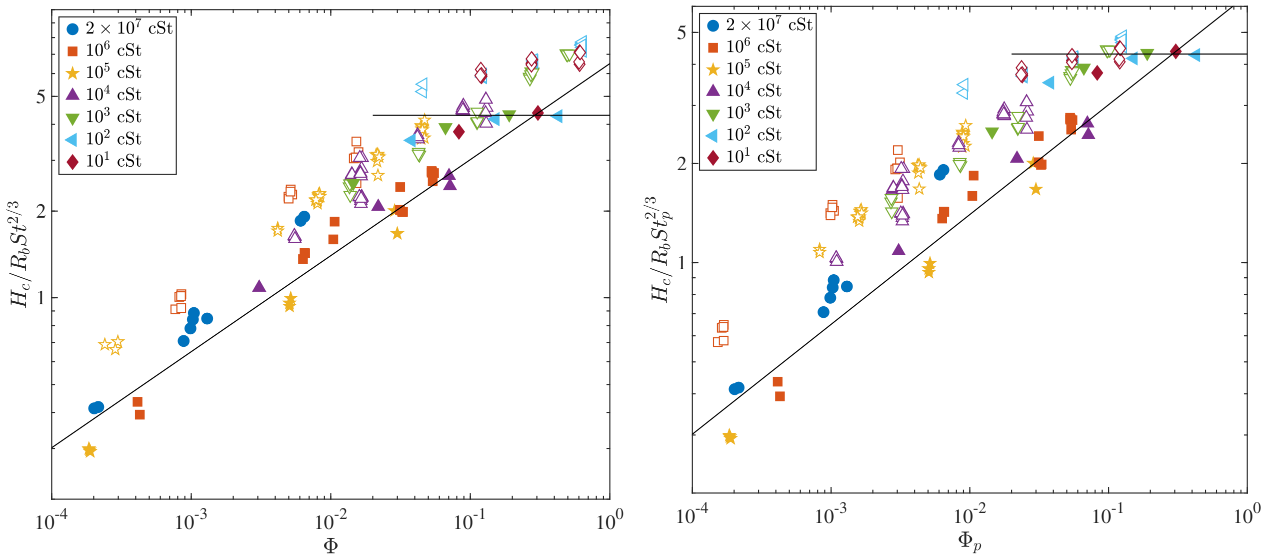

(a) (b)

Figure S1: Different scalings for the normalized centerline height of the air disc versus the impact parameter $\Phi = (\rho_\ell V^2/P_{atm})Re_\ell^{1/3}$. Open markers indicate impacts onto a film of the same liquid and solid markers indicate impacts onto a smooth solid surface. (a) uses the drop impact velocity V in each parameter and (b) uses the penetration velocity V_p in each parameter.

In the body of the main text, figure 3(a), a scaling is presented for the first maximum in the centerline height of the air disc which uses the penetration velocity, $V_p = V/2$ for impacts onto a liquid surface in the Stokes number, and the drop impact velocity in $\Phi = (\rho_\ell V^2/P_{atm})Re_\ell^{1/3}$. Figure S1 presents alternate variations of this scaling by altering which velocity is used in the normalization. Figure S1(a) uses the impact velocity in both the Stokes number and Φ, while figure S1(b) above uses the penetration velocity V_p in all parameters, denoted with a subscript p. While each of these alternate scalings collapse the data for solid or liquid impacts, neither adequately collapses the data for both solid and liquid impacts simultaneously. Therefore, the scaling presented in the main text shows the best collapse and fit of the data.