

Supporting information for:

The dynamic surface tension of water

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Content: Details of Materials and Methods

Surface tension measurements

All examined simple liquids were purchased from Sigma Aldrich and their surface tension values verified using the pendant drop method (Krüss EasyDrop). Since the measured density and surface tension values showed a very good agreement with the literature values ($\pm 0.5\%$) they were used without further purification for the subsequent ultrarapid camera experiments.

Ultrarapid imaging of drop breakup

A 1 ml syringe with an internal diameter of 2 mm was used together with a syringe pump to create controlled drops at a constant flowrate of 0.5 ml/h. Using this setup we recorded movies of the fluid neck rupture using an ultrarapid camera with a frame rate of 54001 fps, an exposition time of 0.98 μ s and a resolution of 224x180 pixels².

Derivation of breakup dynamics from movies

The recorded movies were binarized using the standard binarization tool in ImageJ. For each binarized movie frame at time τ to pinch-off the minimum neck diameter D_{\min} was derived. The obtained $\tau - D_{\min}$ data were linearized by plotting $d_{\min}^{3/2}$ against τ . The universal prefactor A of the inviscid scaling law can be directly derived from the slope C of a linear fit to the data: $C = A^{3/2}(\sigma/\rho)^{1/2}$.