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Rapidly moving contact lines and damping contributions YI XIA, SUSAN DANIEL, PAUL STEEN, Cornell University — Contact angle varies dynamically with contact line (CL) speed when a liquid moves across a solid support, as when a liquid spreads rapidly. For sufficiently rapid spreading, inertia competes with capillarity to influence the interface shape near the support. We use resonant-mode plane-normal support oscillations of droplets to drive lateral contact-line motion. Reynolds numbers based on CL speeds are high and capillary numbers are low. These are inertial-capillary motions. By scanning the driving frequency, we locate the frequency at peak amplification (resonance), obtain the scaled peak height (amplification factor) and a measure of band-width (damping ratio). We report how a parameter for CL mobility depends on these scanning metrics, with the goal of distinguishing contributions from the bulk- and CL-dissipation to overall damping.

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