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**Resonant and antiresonant bouncing droplets** MAXIME HUBERT, DAMIEN ROBERT, HERVÉ CAPS, STÉPHANE DORBOLO, NICOLAS VANDEWALLE, University of Liège, GRASP TEAM — Droplets may bounce on a oscillating liquid surface. Because of the regeneration of the air layer between the drop and the surface, the bouncing droplets may never coalesce with the liquid underneath. We propose here a simple model for millimetric droplets of low viscosity, bouncing on a highly viscous bath. This model consists of two masses, linked together by a spring and a damper, bouncing onto a rigid and oscillating surface. We use this model to understand the shape of the bouncing threshold, the minimal bath acceleration required to sustain the bouncing dynamics. We show that the droplet is submitted to resonant and anti-resonant behaviors. We also show that those two phenomena are size-dependant and do not occur at the same frequencies for droplets of different radii. By means of resonance and antiresonance, we propose a new microfluidic technique to control precisely the droplets size, which only relies on the surface forcing parameters.

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