Dynamic stabilization of a liquid layer against Rayleigh–Taylor instability and buoyant effects

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Vertical oscillations of a liquid have been shown to dynamically stabilize them against the Rayleigh-Taylor instability [1]. Using the fact that air bubbles are able to sink inside an oscillated viscous fluid, we are able to create an air layer below the liquid. We show that it is possible to stabilize in such a manner large quantities of a viscous liquid, up to half a liter, on top of this cushion of air. Furthermore, we show that this allows for the buoyant force to act on objects positioned on the bottom interface of this liquid layer, giving rise to a stable equilibrium position which obeys Archimedes' principle.

Références

1. G. H. Wolf, The Dynamic Stabilization of the Rayleigh–Taylor Instability and the Corresponding Dynamic Equilibrium, *Z. Physik* **227**, 291–300 (1969).