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Pinning transition in shrinking nanobubbles BENG HAU TAN, HONGJIE AN, CLAUS-DIETER OHL, Nanyang Technological University — Surface nanobubbles are unusually long-lived gaseous domains that form on immersed substrates. Although liquid droplets are known to grow or shrink in either an unpinned (constant contact angle) or a pinned (constant footprint radius) mode, surface nanobubbles have only ever been observed in the pinned state. Theory suggests that, provided the nanobubbles are sustained by supersaturated liquid, they are indefinitely stable in the pinned mode, but rapidly dissolve into bulk liquid if not. Yet many basic aspects of the line pinning are not yet clarified, such as its magnitude or the conditions in which it becomes dominant. In this talk we present experiments with total internal fluorescence microscopy in which nanobubbles nucleated with a temperature difference method initially shrink in an unpinned mode, before transitioning to a pinned state. Using a simple energy balance we recover an estimate for the pinning force on each nanobubble.

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