

Abstract Submitted
for the DFD12 Meeting of
The American Physical Society

Hole-Closing of a Surfactant Layer on a Thin Fluid Film

MATTHEW HIN, M. RICHARD SAYANAGI, RACHEL LEVY, Harvey Mudd College, KAREN DANIELS, NC State University — The spreading of surfactants on a thin fluid layer has been most commonly studied in an outward-spreading geometry. We report experiments on the inverse, the inward spreading of surfactant into a clean disk-shaped region, known as hole-closing. We observe that the inward force produces a transient distention, in which the underlying fluid is raised within the closing region. Using a laser line to image the height profile of the fluid surface, we characterize the height and evolution of the fluid distention. We observe that the height of the distention is controlled by a combination of fluid depth, surface tension difference, and chemical composition of both fluid and surfactant. Once formed, the height of the distention decays approximately exponentially, with the timescale primarily set by the particular choice of surfactant and underlying fluid.

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Date submitted: 03 Aug 2012

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