

Abstract Submitted  
for the DFD05 Meeting of  
The American Physical Society

Sorting Category: 19. (T)

**Wave Patterns in Surfactant-Driven Thin Liquid Films**

RACHEL LEVY, Duke University — Thin liquid films driven by surfactant develop complicated wave patterns that are solutions of a coupled system of PDE for the height and surfactant concentration. These solutions can be understood as a combination of similarity solutions, including traveling waves, and discontinuities in the height and surfactant concentration gradient. Thin films with surfactant occur in both biological and industrial applications, in which surfactant is employed to reduce surface tension. In the case of a thin film on an inclined plane, driven by both surfactant and gravity, the downstream height determines which of two distinct wave patterns emerges. The threshold between them is determined analytically and verified by PDE simulations.

- Prefer Oral Session  
 Prefer Poster Session

Rachel Levy  
rlevy@math.duke.edu  
Duke University

Date submitted: 04 Aug 2005

Electronic form version 1.4