

Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

Modeling spreading of nematic droplets¹ TE-SHENG LIN, LINDA CUMMINGS, LOU KONDIC, New Jersey Institute of Technology — Experiments by Poulard & Cazabat² on spreading droplets of nematic liquid crystal reveal a surprisingly rich variety of behavior, including at least two different emerging length-scales resulting from a contact line instability. In earlier work³ we modified a lubrication model for nematic liquid crystals due to Ben Amar and Cummings⁴, and showed that, in a qualitative sense, it can account for much of the observed behavior. In the present work we propose a new approach, that allows us to explore the effect of anchoring variations on the substrate. This in turn gives a simple way to model the presence of defects, which are always present during such liquid crystal flows. The new model leads to additional terms in the governing equation. We first explore the influence of these additional terms for some simple flow scenarios, to gain a basic understanding of their influence, before extending our simulations to the experimental geometry and comparing our results to the experiments.

¹This work was partially supported by NSF Grant No. DMS-0908158

²C. Poulard, A. M. Cazabat, *Langmuir*, 6270, vol. 21 (2005)

³L. J. Cummings, T.-S. Lin, L. Kondic, submitted (2010)

⁴M. Ben Amar, L. J. Cummings, *Phys. Fluids*, 1160, vol. 13 (2001)

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Date submitted: 27 Dec 2010

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