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Modeling spreading of nematic droplets[1] TE-SHENG LIN, LINDA CUMMINGS, LOU KONDIC, New Jersey Institute of Technology — Experiments by Poulard & Cazabat[2] 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 work[3] we modified a lubrication model for nematic liquid crystals due to Ben Amar and Cummings[4], 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.

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