

Abstract Submitted
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Generalized Hydrodynamic Boundary Conditions Applied to Dynamic Switching of Nematic Liquid Crystal Cells¹ ANGBO FANG, Department of Physics, Hong Kong University of Science and Technology — As the size of a liquid crystal display (LCD) cell becomes smaller, boundary effects become more important. The dynamic coupling between flow and orientation order in surface layers can play a significant role when nematic molecules are weakly anchored to the solid boundaries and transitions between bistable configurations involve anchoring breaking. We use Onsager's variational approach along with a heuristic scaling analysis for surface layers to obtain hydrodynamic equations and generalized boundary conditions for nematic liquid crystal cells. As an application, we demonstrate how surface translation-rotation coupling can be utilized to optimize performance of LCD cells. We also discuss how surface dynamics affects the flow-induced transitions in hybrid aligned nematic cells.

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