Abstract Submitted
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Chiral defects of achiral nematic liquid crystals in capillaries with homeotropic anchoring[1] LOUIS KANG, JOONWOO JEONG, ZOEY S. DAVIDSON, University of Pennsylvania, PETER J. COLLINGS, Swarthmore College, TOM C. LUBENSKY, A. G. YODH, University of Pennsylvania — Nematic liquid crystals (LCs) with strong elastic anisotropy can give rise to interesting nontrivial structures in confined geometries. We placed achiral LCs with a small twist elastic modulus in cylindrical capillaries with homeotropic anchoring. The LCs adopt degenerate twisted- and escaped-radial (TER) configurations in which they bend, or escape, towards one end of the capillary and twist along the radius with a handedness. The experimental system using Sunset Yellow FCF, a lyotropic chromonic LC, was investigated by polarized optical microscopy and showed excellent agreement with numerical calculations. Moreover, defects between TER domains of opposite escaping direction and/or twist handedness exhibit a rich phenomenology. Those spanning domains of opposite escaping direction and same twist handedness are strongly energetically disfavored. These findings enrich our understanding about how chiral structures can arise from achiral building blocks and how topological defects interplay with chirality.

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