

P. Bauman: Analysis of Defects in Nematic Liquid Crystals Described by Minimizers of De Gennes' Q-Tensor Energy

We investigate the structure of nematic liquid crystal thin films described by the Landau-de Gennes tensor-valued order parameter model with Dirichlet boundary conditions on the sides of nonzero degree. We prove that as the elasticity constant goes to zero in the energy, a limiting uniaxial nematic texture forms with a finite number of defects, all of degree $1/2$ or $-1/2$, corresponding to vertical disclination lines at those locations.