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Topologically driven local minimizers of the Oseen-Frank energy.

The analogy between certain liquid crystals and superconductivity has been recognized and explored by a number of scientists. In particular, mathematical techniques first developed within the Ginzburg-Landau theory of superconductivity have proven useful when adapted to the setting of liquid crystals. Here we pursue nontrivial stable liquid crystal configurations, motivated by an approach used by the authors in the setting of Ginzburg-Landau to produce persistent currents in topologically nontrivial domains. Our starting point is the Oseen-Frank energy for a nematic, but we add to the standard model a term that penalizes deviation of the director from a given plane. (Received August 17, 2005)