

# FINITE ELEMENT ANALYSIS OF THE LANDAU-DE GENNES MINIMIZATION PROBLEM FOR LIQUID CRYSTALS\*

Timothy A. Davis<sup>†</sup>      Eugene C. Gartland, Jr.<sup>‡</sup>

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## Abstract

This paper describes the Landau-de Gennes free-energy minimization problem for computing equilibrium configurations of the tensor order parameter field that characterizes the molecular orientational properties of liquid crystal materials. Analytical and numerical issues are addressed. Conditions guaranteeing well posedness (existence, regularity) of the problem are given, as is a nonlinear finite element convergence analysis.

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Stacey

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<sup>†</sup>Department of Mathematics, Case Western Reserve University, Cleveland, OH 44106 (tad8@po.cwru.edu).

<sup>‡</sup>Department of Mathematics and Computer Science, Kent State University, Kent, OH 44242 (gartland@mcs.kent.edu). This research was also supported by National Science Foundation grant DMS-9310733.