

Abstract Submitted  
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**Electric field variation within a nematic liquid crystal layer<sup>1</sup>**

LINDA CUMMINGS, ENSELA MEMA, CHENJING CAI, LOU KONDIC, New Jersey Institute of Technology — A thin layer of Nematic Liquid Crystal (NLC) across which an electric field is applied is a setup of great industrial importance in Liquid Crystal Display devices, and there is a wide associated literature. A common assumption is that an electric field generated by constant-potential electrodes at the two bounding surfaces of the layer will produce a field that is uniform: the presence of NLC does not affect the electric field. We derive the equations that couple the electric potential to the orientation of the NLC's director field and use asymptotic and computational methods to address the question: Under what conditions is the uniform field assumption justified, and when is it inappropriate?

[1] Cummings, L.J., Mema, E., Cai, C, and Kondic, L. Electric field variation within a nematic liquid crystal layer, *Phys. Rev. E - Stat. Nonlin. and Soft Matter Phys.*, 90, 2014.

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