

# Uniaxial versus biaxial character of Landau-de Gennes minimizers in three dimensions

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We study global minimizers of the Landau-de Gennes energy functional for nematic liquid crystals, on arbitrary three-dimensional simply connected geometries with topologically non-trivial and physically relevant Dirichlet boundary conditions. Our results are specific to an asymptotic limit defined in terms of a re-scaled reduced temperature,  $t$ . We prove (i) that (re-scaled) global LdG minimizers converge uniformly to a (minimizing) limiting harmonic map, away from the singular set of the limiting map; (ii) we have points of maximal biaxiality and uniaxiality near each singular point of the limiting map (this improves recent results of Contreras and Lamy); (iii) estimates for the size of “strongly biaxial” regions in terms of the reduced temperature  $t$ .

*This is joint work with Duvan Henao and Adriano Pisante.*

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