Effective geometry for light in a ferronematic material

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In general, the physical properties of liquid crystals depend on the molecular orientation displayed at each phase [1], therefore, the variations of parameters such as temperature or magnetic field acts as a way to change these properties through the induction of orientational order. In this work, the rays of light in a ferronematic liquid crystal [2,3] are interpreted as being geodesics in a riemannian space [4] in which the optical medium is mapped through a theoretical model [5,6]. The light trajectories are calculated numerically from a metric (line element) associated with the effective geometry perceived by light that is characterized by variation of a magnetic field applied (control parameter).

References

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