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Tetratic, triatic and nematic liquid crystals on a complex plane[1]
OKSANA MANYUHINA, MARK BOWICK, Syracuse University — Liquid crystals are elastic materials able to resolve geometric and topological frustration by creating disclinations, discontinuities in their continuous orientation field. The strength and the nature of disclinations depend on the symmetry of elements forming liquid crystal phase. Several examples of confined nematic (director field), triatic (Y-field) and tetratic (cross-field) liquid crystals will be considered to show that their ground state contains topological defects. Next, we analyze shape variation of the boundary, enclosing different defect textures. We argue that topological defects can capture essential features of macroscopic shape and relate it to microscopic order, providing a natural way to connect different length scales and to account for large deformations in soft and biological systems.

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