VISUALIZATION OF COMPLEX DEFECT STRUCTURES IN CHIRAL AND ACHIRAL NEMATICS

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Geometrical induced frustration and intrinsic chirality in nematic liquid crystals can enable formation of stable and metastable defect structures of high complexity ranging from knotted nematic braids to skyrmions and hopfions. Selected defect structures obtained by numerical modelling are used to illustrate visualization and optical imaging methods for complex nematic fields [1-4]. Particular attention is given to the simulation of the images obtained with three-photon excitation fluorescence polarizing microscopy[5] that can unveil complex three dimensional nematic fields on micron scale.

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