

Spherical Droplets of Chromonic Liquid Crystals

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Abstract:

We experimentally study director configurations of spherical droplets of chromonic liquid crystals (CLCs) in a water-in-oil emulsion. In CLCs, charged, discotic, and non-amphiphilic molecules self-assemble in water into columnar aggregates via non-covalent interactions. These aggregates condense into nematic or columnar phases, depending on the temperature and concentration, that exhibit interesting bulk elasticity and surface anchoring phenomena such as a very small twist elastic modulus and weak anchoring strengths. Nematic droplets manifest large chiral symmetry breaking in the form of a twisted bipolar director configuration. Columnar droplets exhibit a concentric director configuration with a core line defect and facets. We discuss these director configurations in terms of bulk elasticity and surface anchoring.

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