Spherical shells of Ferroelectric Nematic Liquid Crystal:

Exotic Director Fields and Topological Defects

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The polar symmetry and the extremely high polarization of ferroelectric nematic liquid crystals give rise to peculiar phenomena that are not observed in apolar nematic liquid crystals. Here, we show that ferroelectric nematics confined to thin tangentially aligned spherical shells – imposing a total topological defect charge of +2 cannot form half-integer defects. Further, in forming +1 defects, they avoid radial configurations, instead promoting an azimuthal director field, a behavior that is absent in apolar nematic shells.

We study shells made from a binary mixture of RM734 and DIO with inner and outer aqueous poly(vinyl alcohol) solutions, imposing tangential boundary conditions, in polarizing optical microscopy (POM) while cooling through the liquid crystal phase sequence. The N, SmZ_A, and N_F each exhibit characteristic textures. We are currently analyzing these in detail and will report the results in the poster presentation.

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