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Properties of polymer stabilized cholesteric liquid crystals in the oblique helicoidal state MARIACRISTINA RUMI, TIMOTHY WHITE, TIMOTHY BUNNING, Air Force Rsch Lab - WPAFB — Dimeric liquid crystal molecules, constituted by two rigid units linked by a flexible spacer, exhibit different phase behavior and properties when the spacer has an odd number of methylene units, which imposes a bent shape onto the molecules, relative to monomeric analogues and dimers with even spacers. It has been shown that, when mixed with chiral dopants, these dimeric mesogens can assume an oblique helicoidal conformation of the director under the influence of an electric field directed along the helical axis. This conformation is similar to that of the twist-bend nematic phase, but with pitch controlled by the chiral dopant concentration. We are investigating how the introduction of a polymer network in dimer-containing cholesteric liquid crystals can be used to change and control the equilibrium states of the system, the range of existence of the oblique helicoid state, and the response to external stimuli. Comparison of the system properties with and without a polymer network can provide information on the relative role of boundary conditions, anchoring strength, and elastic energy in stabilizing an oblique helicoid arrangement of the director and in determining which textures it can assume.

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