Photonic Band-Gap and Lasing in Chiral Liquid Crystals Embedded in Planar Microcavity

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Chiral liquid crystals having a periodic modulation of the refractive index exhibit photonic band gaps. The presence of photonic band gap affects the emission spectrum of fluorescent guest molecules. At the band edges, the group velocity approaches zero, and the resulting long dwell times of the emitted photons strongly support stimulated emission. Here, we discuss different approaches to optimize and enhance lasing characteristics in dye doped chiral liquid crystals with respect to cell geometry, helical pitch, fluorescence spectrum of the dyes and guest \ host (lasing dyes \ liquid crystals) combinations. The photonic properties of chiral thin films make them promising for a variety of filter and laser applications.