

Patterns of Umbilical Defects in Liquid Crystals Guided by Topography

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The possibility to exploit the interesting elastic and optical properties of topological defects in liquid crystal relies on the ability to control and manipulate the defects. In this work, we use the interplay between topography and external fields to create switchable arrays of umbilical defects in nematic liquid crystals. Tuning the external (electric) field, we can switch the liquid crystal alignment between stable configurations that give rise to multiple patterns of defects. In this way we create switchable diffraction gratings with different symmetry. This system offers a promising route for the design of tunable patterns that can be employed in optics and self-assembly.