

Abstract Submitted
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Effects of Electric Fields on Lamellar Structures of Liquid-Crystalline Block Copolymers SIMISO MKHONTA, Department of Physics and Astronomy, Wayne State University, Detroit, Michigan 48201, USA, ZHI-FENG HUANG, Department of Physics and Astronomy, Wayne State University, Detroit, Michigan 48201, USA, KEN ELDER, Department of Physics, Oakland University, Rochester, Michigan 48309, USA, MARTIN GRANT, Physics Department, McGill University, Montreal, Canada — We investigate the electrically induced lamellar contraction in microphase separated liquid-crystalline diblock copolymer using the phase field-crystal model. We demonstrate that collective rotations of the constituents liquid-crystal molecules relative to the layer normal can lead to unusually large changes of the lamellar spacing. We also demonstrate that the orientational order of the constituent liquid-crystals can accelerate microphase separation and can also lead to fast dislocation motion. Our results are directly relevant to the studies of electrically tunable block copolymer photonic crystals with a full color display.

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