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Orientation selection of block copolymer lamellar phases under oscillatory shear CHI-DEUK YOO, JORGE VINALS, School of Physics and Astronomy, University of Minnesota — A hydrodynamic description of complex fluids that are structured at the nanoscale necessitates the introduction of appropriate order parameters reflecting the broken symmetries of the fluid, and their coupling to velocity fields and transport. We describe the equations of motion for a uniaxial fluid, and use them to study rheology and orientation selection of a block copolymer under shear. Viscoelastic response is also introduced at this scale, which is shown to lead to local, effective viscoelastic contrast that depends on the local orientation of the lamellae. We further explore domain boundary instabilities that arise from viscoleastic contrast, and their relationship to domain orientation selection in large samples under oscillatory shears.

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