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Bloch wall defects in nematic thin films: experiments and simulations[1] MOHAN SRINIVASARAO, School of Polymer, Fiber and Textile Engineering, School of Chemistry and Biochemistry, Georgia Institute of Technology, Atlanta, GA 30332, JIAN ZHOU, JUNG O. PARK, School of Polymer, Fiber and Textile Engineering, GINO DE LUCA, Department of Chemical Engineering, McGill University, ALEJANDRO D. REY, Department of Chemical Engineering, McGill University, Montreal, Quebec H3A 2B2, Canada — We study Bloch wall defects formed by quenching nematic thin films from planar anchoring to homeotropic anchoring through a temperature-driven anchoring transition. We show direct visualization of two types of Bloch walls, pure twist walls and diffuse walls, using fluorescence confocal polarizing microscopy (FCPM) technique. We describe the simulations of the evolution of the Bloch walls with varying anchoring strengths using Frank elasticity, which agree remarkably well with the experimental FCPM observation.A pure twist wall exists if the ratio of sample thickness to surface extrapolation length p is smaller than or close to 1; while a diffuse Bloch wall is obtained if p is much greater than 1.

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