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Topological Defect Structure and Annihilation in High-Polarization Freely Suspended Films CHENHUI ZHU, APICHART PATANAPORKRATANA, JOSEPH MACLENNAN, NOEL CLARK, Department of Physics and Liquid Crystal Material Research Center, University of Colorado at Boulder — The texture of freely suspended liquid crystal SmC* films of a high polarization material C7 [4-(3-methyl-2-chloropentanoyloxy)-4'-heptyloxybiphenyl] is studied using polarized light microscopy. In particular, we focus on c-director defects with topological strength -1 found in the chessboard texture. Due to the competition between the elastic energy and the electrostatic energy of polarization splay, the c-director field near the defect core consists of four domains with homogenous orientation of the c-director inside each domain. The boundaries between domains are sharp and the c-director orientation jumps by 90 degrees at each boundary. We will present experimental and theoretical studies of the structure of these polarization-stabilized discontinuities. We will also present studies of the annihilation dynamics of $+1$ and -1 pairs of defects on this high-P material film and compare them to those on low-P material films. [1] E. Demikhov, *Europhys. Lett.* **25** (4), 259 (1994). [2] E. Demikhov and H. Stegemeyer, *Liq. Cry.* **18**, 37 (1995). [3] Ch. Bahr and G. Heppke, *Phys. Chem.* **91**, 925 (1987). [4] D. R. Link, N. Chattham, J.E. Maclellan, and N.A. Clark, *Phys. Rev. E* **71**, 021704 (2005). This work is supported by NSF MRSEC Grant DMR0213918.

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