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**Annihilation of Point Defects in Smectic-C Liquid Crystal Films**

CHENHUI ZHU, Department of Physics and Liquid Crystal Material Research Center, University of Colorado at Boulder, CHRIS MUZNY, ANURANJITA TEWARY, DARREN LINK, AURELIEN FRITZ, DAVID COLEMAN, JOSEPH MACLENNAN, NOEL CLARK — An experimental study of the pair annihilation of  $c$ -director defects with topological strength  $+1$  and  $-1$  in a freely suspended Sm-C film is described. Many pairs of  $+1$  and  $-1$  point defects are produced mechanically on the film by transient generation of compressive in-plane stress, and their subsequent behavior is studied using polarized video microscopy. The defects show local positional fluctuations and are attracted by long-range elastic forces. Immediately following their generation several hundred defects are observed, which attract and annihilate until only a few are left. The subsequent dynamics of isolated pairs of defects are then studied. It is found that  $r(t) \bullet v(r(t))$ , the product of defect separation and the mean velocity of attraction  $v(r)=dr/dt$ , decreases as  $r \rightarrow 0$ . The behavior of  $r(t) \bullet v(r(t))$  is not understood theoretically. This work is supported by a NSF and by NSF MRSEC Grant DMR0213918.

- [1] D. Svensek and S. Zumer, Phys.Rev.Lett. **90**, 155501 (2003).
- [2] Géza Tóth, Colin Denniston, and J. M. Yeomans, Phys.Rev.Lett. **88**, 105504 (2002).
- [3] Patrick Oswald and Jordi Ignés-Mullol, Phys.Rev.Lett. **95**, 027801 (2005).

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