

Abstract Submitted
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Resonant soft X-ray scattering study of twist bend nematic phase¹ CHENHUI ZHU, Advanced Light Source, Lawrence Berkeley National Laboratory, ANTHONY YOUNG, CHENG WANG, ; ALEXANDER HEXEMER, Advanced Light Source, Lawrence Berkeley National Laboratory, QUAN LI, ; OLEG LAVRETOVICH, LCI, Kent State University, DAVID WALBA, Department of Chemistry and Biochemistry, University of Colorado Boulder, MICHAEL TUCHBAND, MIN SHUAI, ; NOEL CLARK, Department of Physics, University of Colorado at Boulder — Liquid crystals (LCs) form many interesting nano-scale structures, many of which can be probed with X-ray scattering techniques, typically hard X-rays due to its high penetrating power. However, in the hard X-ray regime, the scattering contrast of some LC nanostructures can be extremely low due to their weak electron density modulation. Here we show it is possible to use resonant soft x-rays to probe the helical pitch of the newly discovered twist bend nematic phase [1,2], which is purely a twist bend structure with no electron density modulation. The in-situ temperature dependent measurement will be presented and discussed. This work together with our previous study on the helical nanofilament B4 phase [3] shows the great potential of soft x-ray scattering in liquid crystals. [1] D. Chen, et al. *PNAS*, DOI 1314654110 (2015). [2] V. Borshch, et al. *Nat. Comm.*, **4**, 2635 (2015). [3] C. Zhu, et al. *Nano. Lett.* **15**, 3420 (2015).

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