

Abstract Submitted  
for the MAR06 Meeting of  
The American Physical Society

**Using micro-focus synchrotron X-ray diffraction to probe textured liquid crystal samples**<sup>1</sup> RONALD PINDAK, BRANDON CHAPMAN, Brookhaven National Lab, RUITING WANG, ISHTIAQUE SYED, GIOVANNI CARBONE, CHARLES ROSENBLATT, Case Western Reserve Univ., MACHI NAKATA, CHRISTOPHER JONES, NOEL CLARK, Univ. of Colorado, SHINWOONG KANG, Kent State Univ., SATYENDRA KUMAR, National Science Foundation, JULIE CROSS, Argonne National Lab — 16 KeV X-rays from a bend magnet source at Sector 20 of the Advanced Photon Source were micro-focused by Kirkpatrick-Baez mirrors to a  $14\mu\text{m} \times 14\mu\text{m}$  cross-section and used in conjunction with an in-situ polarizing optical microscope to measure the diffraction from select areas in textured liquid crystal samples between thin glass plates. The technique will be described and its utility illustrated by three examples: (1) measuring the orientational deformation of smectic-A liquid crystal layers under the bend strain imposed by an AFM-scribed polymer alignment film, (2) mapping the concentration dependence of the liquid crystal phases exhibited by suspensions of short DNA oligomers of 6 to 16 base-pairs, and (3) selecting local monodomain regions from a globally unaligned conducting porphyrin-derivative sample for structural determination of its liquid crystal phases.

<sup>1</sup>supported in part by the U.S. Department of Energy under grant No. 04SCPE389

Ronald Pindak

Date submitted: 30 Nov 2005

Electronic form version 1.4