

Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Atomic force microscopy observation of surface reconstruction in crystalline-B films DANIEL MARTINEZ ZAMBRANO, JEFFREY COLLETT, Lawrence University, Appleton, WI 54911 — Atomic force microscopy observation of surface reconstruction in crystalline-B films Surfaces of freely suspended thick films of 4-n-heptyloxybenzylidene-4-n-heptylaniline (7O.7) have been imaged using non-contact mode atomic force microscopy. We find direct evidence that the surface layers differ from the crystalline-B interior. The surface is flat in contrast to the modulated layer structure seen in bulk 7O.7. We measure an average roughness of 0.03 ± 0.02 nm compared to the 0.15 nm value expected for modulated layers. Steps are observed on the surface of the film with a height of 3.1 ± 0.2 nm and a width of 1.0 ± 0.6 μm . The height matches the extended length of the 7O.7 molecule, but the large width suggests that the additional molecular layers come from edge dislocations in the interior of the film. Although there is no direct evidence for molecular tilt at the surface from the AFM measurements, the results are consistent with a Smectic-F surface over a modulated crystalline-B interior.

Jeffrey Collett
Lawrence University

Date submitted: 08 Nov 2013

Electronic form version 1.4