Abstract Submitted
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Thickness study of Langmuir-Blodgett Films of Copolymers of Vinylidene Fluoride with Trifluoroethylene using X-ray Reflectivity[1] JIHEE KIM, STEPHEN DUCHARME, SHIREEN ADENWALLA, Physics and Astronomy at University of Nebraska-Lincoln — Nanometer thickness scale control is one of the advantages of ferroelectric polymer films made by Langmuir-Blodgett (LB) deposition technique, compared to conventional techniques, such as solvent spin coating and casting, but polymers do not always form true monomolecular layer. Therefore, film thickness must be calibrated independently. We report measurements of sample thickness using x-ray reflectivity (XRR), a powerful tool to measure the thickness of ultrathin films, which is also suitable for polymer LB films. The XRR data from LB films of copolymers of vinylidene fluoride with trifluoroethylene deposited on thick silicon wafers exhibit up to six interference oscillations. Fitting by the Kiessig fringe method results thickness measurements averaging 2.8 $\pm$ 0.2 nm, 2.6 $\pm$ 0.2 nm, and 2.3 $\pm$ 0.2 nm per LB transfer, for copolymers consisting of 80%, 70% and 50%, respectively, of vinylidene fluoride, which means that 1 LB transfer consists of approximately 6 molecular layers. The results are consistent with ellipsometric measurements made on similar films [M. Bai *et al.*, *J. Appl. Phys.* **95**, 3372 (2004)].

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