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Fabrication of a Liquid Crystal Capacitor Cell using Spin-Coating
LOGAN TATE, TABATHA DUCHARME, CHANDRA PRAYAGA, AARON WADE, University of West Florida, Physics, MICHAEL HUGGINS, REBECCA CHANDLER, AMY RENAUD, University of West Florida, Chemistry — This paper presents our work to fabricate and characterize a liquid crystal capacitor cell using novel liquid crystals. These LCs are not in their isotropic phase at room temperature and require the capacitor cells to be fabricated around them. This was done using spin coating where the samples were dissolved in Toluene, Anisole, or C_4CL. Next, the liquid crystals were spin-coated on either an ITO coated glass slide or a separate silicon wafer. This spin coating process was done in two stages where the first stage started at a slow speed to begin spreading the sample, and then during the second stage the spin coater ramped to a higher rpm to thin the sample while removing excess material. M-Line spectroscopy was used to determine the films thickness of the silicon substrate sample. To make the capacitor cell, a second ITO coated slide was placed on top of the first and the edges sealed with epoxy. Wires were soldered to the bus bars and the samples were mounted in a temperature controlled environment constructed in the lab and an RC circuit was assembled using the LC capacitor. Initial dielectric measurements were taken at room temperature to ensure the integrity of the cell.

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