

Abstract Submitted
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Resonance Circuit with a Nonlinear Liquid Crystal Capacitor

CHLOE RENFROE, SAMUEL BECK, Undergraduate, SAMI ALSHEIKH, Pensacola High School, CHANDRA PRAYAGA, TIM ROYAPPPA, Faculty Advisor — The liquid crystal 4'octyl-4-cyanobiphenyl (8CB) was injected into a commercially available liquid crystal capacitor cell (INSTECH, Inc). The cell was housed in a temperature-controlled environment constructed in the lab and a resonant circuit was assembled using the 8CB capacitor. The temperature of the capacitor was varied over the range 25 ° C to 45 ° C, covering the smectic, nematic, and isotropic phases. The sample was held at each temperature with a precision of 1mK before measuring the resonance curve with a network analyzer. The results showed a non-linearity in the resonance curve in the nematic phase, distorting the shape of the resonance curve. The corresponding curves for the smectic and isotropic phases were linear.

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