

Abstract Submitted
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Nonlinear Dielectric Response of the Liquid Crystal 8CB near the phase transitions HANNAH BUCHANAN, University of West Florida — The nonlinear dielectric response of the liquid crystal (LC) 8CB (4'-octyl-4-cyanobiphenyl) was measured near the smectic-nematic and nematic-isotropic phase transitions. The sample was filled in a commercially available LC capacitor cell of dimensions ($1\text{ cm} \times 1\text{ cm} \times 9\text{ }\mu\text{m}$). The cell was mounted in a temperature-controlled environment with a stability and resolution of 1 mK. The capacitance of the cell was measured at different temperatures in the range $25 - 45\text{ }^\circ\text{C}$ covering both phase transitions, and over a range of frequencies up to 100 kHz, and a signal level in the range of $0 - 5\text{ V}$, using a lock-in amplifier (SRS830) and LCR meter (Fluke PM6304). Nonlinear effects were observed in the capacitance even at a 200 mV signal level, and very large changes in the capacitance, both linear and nonlinear, were observed in the nematic phase, near each phase transition. *Undergraduate physics students
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