

Abstract Submitted
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New experimental techniques to measure the electroclinic effect in smectic liquid crystals JOSHUA FANKHAUSER, LONI FULLER, Student Researcher, JONATHAN FERNSLER, Advisor — Liquid crystals have very unique properties that allow them to alter light in ways that many materials cannot. The smectic liquid crystal phases are fluid, layered arrangements of molecules. We are using a technique to measure both the tilt of molecules away from the direction normal to the layer plane and birefringence as a function of temperature as well as electric field. This is done by projecting light through two polarizers and observing the effect that the sample has on the polarization of the light. The system used to gather data for the sample is a newly automated Matlab program along with a standard temperature logging program. The Matlab program was developed this year to gather accurate intensity readings at a rapid rate and export them for further analyzing. The program is also interfaced with a Labjack so that we will be able to observe and collect data on the unusually large electroclinic effect, the coupling between molecular tilt and applied electric field, in our deVries liquid crystals.

Joshua Fankhauser
Student Researcher

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