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Anisotropic Differential Reflectance Spectroscopy of Thin GeSe
JOSEPH MATSON, Hendrix College, GRACE WOODS, University of California Santa Cruz, HUGH CHURCHILL, University of Arkansas Fayetteville — Atomically thin monochalcogenides are predicted to exhibit a two-dimensional structural phase transition. This phase transition could be useful for designing new phase change memory devices. The critical temperature is dependent on the material as well as the thickness, and is predicted to occur just above room temperature for monolayer GeSe. We used differential reflectance spectroscopy on thin samples of GeSe to measure changes in the optical anisotropy with temperature as a signature of this phase transition. We constructed an apparatus for temperature-depedendent spectroscopy of micro-scale GeSe samples, and measured anisotropic optical absorption of thin GeSe. We observed a decrease in optical anisotropy of GeSe at elevated temperatures, which may be a first indication of the continuous transition from a rectangular to a square lattice in that material. This work was supported by NSF REU Grant #EEC-1359306.

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