

Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

Temperature Dependent Photocurrent Spectroscopy of Few Layer $\text{CuIn}_7\text{Se}_{11}$ ¹ MILINDA WASALA, PRASANNA PATIL, SUJOY GHOSH, Southern Illinois University Carbondale, IL, SIDONG LEI, ROBERT VAJTAI, PULICKEL AJAYAN, Rice University, Houston, TX, SAIKAT TALAPATRA, Southern Illinois University Carbondale, IL — Group III-VI based 2D semiconductor, due to their exotic optical properties, could possibly lead to multifunctional opto-electronic applications such as tunable photo detectors. Here, we report on the detailed study on temperature dependent photocurrent spectroscopy of few layer $\text{CuIn}_7\text{Se}_{11}$, mechanically exfoliated from crystals grown using chemical vapor transport technique. $\text{CuIn}_7\text{Se}_{11}$ photocurrent spectra reveals the information about the direct band gap, indirect band gap as well as the band gap variation with the temperature. Further, the gate voltage can be used to tune the wavelength dependent photoresponse nature of these materials. These key findings and comparative analysis of group III-VI based photo detectors will be discussed.

¹This work is supported by the U.S. Army Research Office through a MURI grant W911NF-11-1-0362.

Milinda Wasala
Southern Illinois University Carbondale, IL

Date submitted: 11 Nov 2016

Electronic form version 1.4