Abstract Submitted
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Field Effect Transistors Using Atomically Thin Layers of Copper Indium Selenide (CuInSe)[1] PRASANNA PATIL, SUJOY GHOSH, MILINDA WASALA, Southern Illinois University Carbondale, SIDONG LEI, ROBERT VAJTAI, PULICKEL AJAYAN, Rice University, SAIKAT TALAPATRA, Southern Illinois University Carbondale — We will report fabrication of field-effect transistors (FETs) using few-layers of Copper Indium Selenide (CuInSe) flakes exfoliated from crystals grown using chemical vapor transport technique. Our transport measurements indicate n-type FET with electron mobility ≈ 3 cm^2 V^{-1} s^{-1} at room temperature when Silicon dioxide (SiO_2) is used as a back gate. Mobility can be further increased significantly when ionic liquid 1-Butyl-3-methylimidazolium hexafluorophosphate (BMIM-PF_6) is used as top gate. Similarly subthreshold swing can be further improved from 103 V/dec to 0.55 V/dec by using ionic liquid as a top gate. We also found ON/OFF ratio of $\approx 10^2$ for both top and back gate. Comparison between ionic liquid top gate and SiO_2 back gate will be presented and discussed.

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Prasanna Patil
Southern Illinois University Carbondale

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