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Electrical and Photoconductivity study on few layers $ReSe_2$[1] NIHAR PRADHAN, CARLOS GARCIA, Natl High Magnetic Field Lab, Tallahassee, FL, USA , BRIDGET ISENBERG, Natl High Magnetic Field Lab, Tallahassee, FL, USA and and Lincoln high school, Tallahassee, FL, USA, DANIEL RHODES, SHAHRIAR MEMARAN, JOSHUA HOLLEMAN, STEPHEN MCGILL, LUIS BALICAS, Natl High Magnetic Field Lab, Tallahassee, FL, USA — Transition metal dichalcogenides (TMDs) have emerged as attractive materials for electronic and optoelectronic device applications due to their tunable band gap as a function of layers and easier to produce single atomic layer form, which could be potential pathways beyond CMOS technologies. Among the TMDs semiconductors, extensive research has been conducted on few compounds such as MoS_2, WS_2, and WSe_2 focusing on electrical and optical properties of single-to-few atomic layers. These compounds show direct band gap transition when exfoliated to single layer from bulk crystals. However, there are other layered materials such as ReS_2, $ReSe_2$, InSe, etc. are recently reported displays direct band gap irrespective to the number of layers, makes promising application in optoelectronics. Here, we present an intrinsic electrical and photoconductivity study on less studied $ReSe_2$ compound, mechanically exfoliated on to the Si/SiO_2 substrate. The field-effect mobility at room temperature of few-layered $ReSe_2$ device is ~$10cm^2/Vs$. Hopefully we will also present the detail electrical transport properties of $ReSe_2$ field-effect transistors as a function of temperature.

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