

Abstract Submitted  
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**The effect of defects produced by electron irradiation on the electrical properties of graphene and MoS<sub>2</sub>** JULIO ALEJANDRO RODRIGUEZ-MANZO, ADRIAN BALAN, CARL NAYOR, WILL PARKIN, MATTHEW PUSTER, A.T. CHARLIE JOHNSON, MARIJA DRNDIC, Univ of Pennsylvania — We present a study of the effects of the defects produced by electron irradiation on the electrical and crystalline properties of graphene and MoS<sub>2</sub> monolayers. We realized back or side gated electrical devices from monolayer MoS<sub>2</sub> or graphene crystals (triangles respectively hexagons) suspended on a 50nm SiN<sub>x</sub> m. The devices are exposed to electron irradiation inside a 200kV transmission electron microscope (TEM) and we perform in situ conductance measurements[1]. The number of defects and the quality of the crystalline lattice obtained by diffraction are correlated with the observed decrease in mobility and conductivity of the devices. We observe a different behavior between MoS<sub>2</sub> and graphene, and try to associate this with different models for conduction with defects. Finally, we use the TEM electron beam to tailor the macroscopic layers into ribbons to be used as the sensing element in MoS<sub>2</sub> nanoribbon - nanopore devices for DNA detection and sequencing . [1] Towards sensitive graphene nanoribbon-nanopore devices by preventing electron beam induced damage. M. Puster, J. A. Rodriguez- Manzo, A. Balan, M. Drndic. ACS Nano,10.1021/nm405112m.

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