Abstract Submitted
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Spin injection and transport in graphene layers[1] WEI-HUA WANG, KEYU PI, WENZHONG BAO, KATHY MCCREARY, WEI HAN, JEANIE C. N. LAU, ROLAND K. KAWAKAMI, Department of Physics and Astronomy, UC Riverside — Graphene is an intriguing material system for spintronics research. Due to its low atomic number and low spin-orbit coupling, graphene is an excellent candidate for spin transport. In our past study, we have demonstrated spin-polarized transport in mesoscopic graphite by two-probe spin-valve devices [1]. Recently, we further investigated this topic and fabricated non-local spin-valve devices consisting of single-layer and few-layer graphene. Ferromagnet (FM) and nonmagnetic electrodes are formed by using electron beam (e-beam) lithography and e-beam evaporation. Thin tunnel barriers consisting of magnesium oxide are inserted between graphene layers and FM electrodes to overcome conductivity mismatch and enhance spin injection efficiency. Atomic force microscopy and Auger spectroscopy are used to characterize their morphology and chemical composition. We performed magneto-transport using the Johnson-Silsbee geometry in a cryogenic environment and observed non-local spin signal up to room temperature. This unambiguously demonstrates the spin injection, transport and detection in graphene materials. [1] W.-H. Wang, *et. al.*, Phys. Rev. B (Rapid Communications), in press.

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