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Enhanced Spin Injection into Graphene with MgO Tunnel Barriers WEI HAN, University of California, Riverside, KEYU PI, KATHY MCCREARY, YAN LI, ROLAND KAWAKAMI — Graphene is an attractive material for spintronics due to its tunable carrier concentration and polarity, weak spin-orbit coupling, and the prediction of novel spin-dependent behavior. We investigate the spin dependent properties in single layer graphene (SLG) spin valves via nonlocal magnetoresistance (MR) measurements. We compare two types of SLG spin valves: with transparent contacts (Co/SLG) and with tunneling contacts (Co/MgO/SLG) It is shown that with MgO tunnel barrier, the nonlocal MR is increased and the spin injection efficiency is greatly enhanced. Temperature dependence of the SLG spin valves is studied. Also, our results show that the nonlocal MR is dependent on the gate voltage and DC bias current.

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