

Abstract Submitted
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Enhanced spin injection and spin lifetime in Graphene¹ WEI HAN, KEYU PI, KATHLEEN MCCREARY, YAN LI, ROLAND KAWAKAMI — Graphene is an attractive material for spintronics due to the low intrinsic spin-orbit and hyperfine coupling, which should lead to excellent spin transport properties. Earlier studies on spin injection and transport in graphene present two major challenges: low spin injection efficiency and short spin lifetimes compared to the theoretical predictions. In our work, we utilized TiO₂ Seeded MgO barriers and achieved tunneling spin injection into single layer. As a result, large nonlocal magnetoresistances were observed at room temperature, with high spin injection efficiency up to 30%. Surprisingly, enhanced spin lifetimes of graphene are obtained, which is due to reducing the contact-induced spin relaxation by inserting tunnel barrier between graphene and Co electrodes.

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