Abstract for an Invited Paper
for the NWS09 Meeting of
The American Physical Society

Spin-Resolved Quantum Interference in Graphene[1]

JOSHUA FOLK, University of British Columbia

The unusual electronic properties of single-layer graphene make it a promising material system for fundamental advances in physics, and an attractive platform for new device technologies. Graphene's spin transport properties are expected to be particularly interesting, with predictions for extremely long coherence times and intrinsic spin-polarized states at zero field. In order to test such predictions, it is necessary to measure the spin polarization of electrical currents in graphene. Here, we resolve spin transport directly from conductance features that are caused by quantum interference. These features split visibly in an in-plane magnetic field, similar to Zeeman splitting in atomic and quantum dot systems. The spin-polarized conductance features that are the subject of this work may, in the future, lead to the development of graphene devices incorporating interference-based spin filters.

[1]Research funded by CFI, CIFAR, and NSERC