Abstract Submitted
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Large Magnetoresistance in Nanostructured Armchair Graphene Nanoribbon Junctions[1] SUCHUN LI, National University of Singapore and Institute of High Performance Computing, YOUNG-WOO SON, Korea Institute for Advanced Study, SU YING QUEK, National University of Singapore and Institute of High Performance Computing — The prospect of all-carbon nanoelectronics has motivated significant interest in the transport of electrons through graphene and graphene nanoribbon (GNR) based junctions.... The weak intrinsic spin-orbit coupling in graphene also makes graphene an attractive candidate for replacing conventional materials in spintronics applications. Several interesting spin transport properties, such as giant magnetoresistance and half-metallicity, have been predicted. Most of these predictions have centered on GNRs with zigzag atomic edges (ZGNRs). On the other hand, significant progress has been made in the controlled atomic-scale synthesis of GNRs with *armchair* edges (AGNRs), all with specific widths.... Yet, to date, little is known about the potential of such well-defined AGNRs in electronics or spintronics. In this work, we use first principles transport calculations to predict the electron and spin transport properties of nanostructured AGNR junctions. We predict a large magnetoresistance of $\sim 900\%$, related to resonant transmission channels close to the Fermi energy.

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