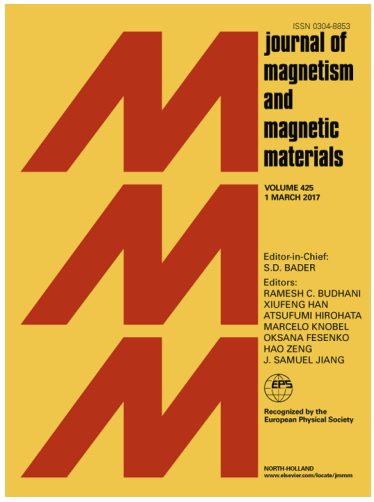

Research articles

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The anisotropic tunneling behavior of spin transport in graphene-based magnetic tunneling junction

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ABSTRACT

Due to the theoretical prediction of large tunneling magnetoresistance (TMR), graphene-based magnetic tunneling junction (MTJ) has become an important branch of high-performance spintronics device. In this paper, the non-collinear spin filtering and transport properties of MTJ with the Ni/tri-layer graphene/Ni structure were studied in detail by utilizing the non-equilibrium Green's formalism combined with spin polarized density functional theory. The band structure of Ni-C bonding interface shows that Ni-C atomic hybridization facilitates the electronic structure consistency of graphene and nickel, which results in a perfect spin filtering effect for tri-layer graphene-based MTJ. Furthermore, our theoretical results show that the value of tunneling resistance changes with the relative magnetization angle of two