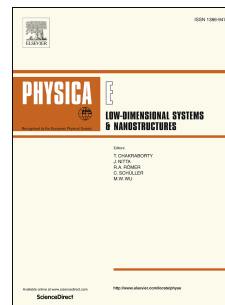


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Spin-polarized currents in a two-terminal double quantum ring driven by magnetic fields and Rashba spin-orbit interaction

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Abstract

Aim of this study is to investigate spin transportation in double quantum ring (DQR). We developed an array of DQR to measure the transmission coefficient and analyze the spin transportation through this system in the presence of Rashba spin-orbit interaction (RSOI) and magnetic flux estimated using S-matrix method. In this article, we compute the spin transport and spin-current characteristics numerically as functions of electron energy, angles between the leads, coupling constant of the leads, RSOI, and magnetic flux. Our results suggest that, for typical values of the magnetic flux (Φ/Φ_0) and Rashba constant (α_R), such system can demonstrates many spintronic properties. It is possible to design a new geometry of DQR by incoming electrons polarization in a way to optimize the system to work as a spin-filtering and spin-inverting nano-device with very high efficiency. The

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