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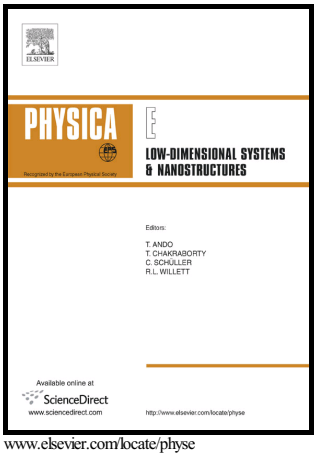

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Graphene-based spin switch device via modulated Rashba Field and Strain

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Abstract

We investigate the spin-resolved transport in a two-terminal zigzag graphene nanoribbon device with two independent gate induced Rashba spin-orbit coupling regions and in the presence of strain. By employing a recursive Green's function technique to the tight-binding model for the graphene nanoribbon, we calculate the spin-resolved conductance of the system. We show that by switching the sign of one of the gates it is possible to select which spin component will be transmitted. Moreover, our results show that an uniaxial strain applied to the nanoribbon plays a significant role in the transport, providing and additional manner to control the spin-polarized conductance. This makes the present system a potential candidate for future implementations of spin-based mechanical strain sensors.

Keywords: graphene nanoribbon, spin polarized FET, spin-orbit, uniaxial strain

1. Introduction

Fine control of electron spin degrees of freedom in nanostructures is crucial for the development of future spin-based electronics.[1] With the advances in

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