

Abstract Submitted
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An exact solution to the problem of spin edge states¹ SAMVEL BADALYAN, Department of Physics, University of Regensburg, 93040 Regensburg, Germany and Department of Radiophysics, Yerevan State University, Armenia, VAHRAM GRIGORYAN, Department of Radiophysics, Yerevan State University, 1 A. Manoukian Street, 375025 Yerevan, Armenia, ALEX MATOS ABIAGUE, Department of Physics, University of Regensburg, 93040 Regensburg, Germany — We study the spin edge states, induced by the combined effect of spin-orbit interaction $\Delta\text{SOI}\Theta$ and hard-wall confining potential, in a two-dimensional electron system, exposed to a perpendicular magnetic field. We find an exact solution of the problem and show that the spin-resolved edge states are separated in space. The SOI-generated rearrangement of the spectrum results in a peaked behavior of the net-spin current versus the Fermi energy. The predicted oscillations of the spin current with a period, determined by the SOI-renormalized cyclotron energy, can serve as an effective tool for controlling the spin motion in spintronic devices.

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