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Spin signal recovery in a two-dimensional electron gas with a quantum point contact JAE-SEUNG JEONG, HYUN-WOO LEE, Department of Physics, Pohang University of Science and Technology — We study transport properties of the spin-polarized current in a two-dimensional electron gas(2DEG) including a quantum point contact(QPC) in the presence of Rashba spin-orbit(RSO) coupling. Spin-resolved conductance is investigated numerically using a recursive Green function method, with special attention to the quantum effects of spin-charge transport channels. It is found that when the conductance is examined as a function of the RSO coupling strength, the conductance modulation ratio, defined as the ratio between the maximum and minimum conductances, can be enhanced by the QPC in the ballistic and weakly diffusive regime as well. Decaying rate of the spin-polarization can be also reduced.

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