

Abstract Submitted
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Spin polarization of electrons in 2D structures due to reflection from a barrier¹ V. TEODORESCU, Department of Physics, Northern Illinois University, DeKalb, IL 60115, R. WINKLER, Department of Physics, Northern Illinois University, DeKalb, IL 60115 and Advanced Photon Source, Argonne National Laboratory, Argonne, IL 60439 — In two-dimensional semiconductor structures Rashba spin-orbit coupling can orient the electron's spin in two opposite directions perpendicular to the direction of motion. We analyze here the possibility to change the spin polarization of an electron beam which is reflected from a barrier in the 2D plane. In general, an unpolarized incident beam gives rise to three reflected beams with different polarizations [1]. We give the orbital and spin parts of the current densities inside and outside of the interference zones. Also we estimate for an initially unpolarized (or partially polarized) electron beam the change of the degree of polarization due to multiple reflections between two parallel barriers in a ballistic regime using realistic material parameters. [1] A. O. Govorov et al., Phys. Rev. B 70, 245310 (2004)

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