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Spin interference in quantum rings manipulated with quantum point contacts[1] FRANCISCO MIRELES, Centro de Nanociencias y Nanotecnología - UNAM, México, LEO DIAGO, Universidad de la Habana, Cuba — The Aharonov-Bohm (AB) and Aharonov-Casher (AC) effects are two well known interference phenomena that may appear in semiconductor quantum rings (QR's). Although the AB effect has been long observed, its counterpart, the AC effect has been only recently detected in clever magnetoconductance oscillations experiments on HgTe/HgCdTe based QR's exhibiting strong Rashba SO-interaction [1]. In this work, using the S-matrix formalism we study the role of the contacts between the leads and the QR on the AB and AC conductance oscillations of the device in the presence of Rashba and Dresselhaus type of SO interactions. We describe the backscattering and transparence of the conjunctions lead-to-ring through quantum point contacts (QPCs) modelled with gate-controllable saddle-point potentials. The variable transmitivity of the QPCs, adjusted in the experiment by gate voltages and/or applied magnetic fields, is readily incorporated in our approach. It is shown that manipulating electrostatically the confinement strength at the QPCs, may be of utility to implement a novel way to modulate spin interference effects in semiconductor quantum rings. [1] M. König *et al.*, PRL **96**, 076804 (2006).

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