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Controlling spin in an electronic interferometer with spin-active interfaces CHRISTOPH BRUDER, Dept. of Physics and Astronomy, University of Basel, CH-4056 Basel, Switzerland, AUDREY COTTET, Laboratoire de Physique des Solides, Université Paris Sud, F-91405 Orsay Cedex, France, TAKIS KONTOS, Laboratoire Pierre Aigrain, Département de Physique, ENS, 24, rue Lhomond, F-75231 Paris Cedex 05, France, WOLFGANG BELZIG, University of Konstanz, Theoretical Solid State Physics, Department of Physics, M703, D-78457 Konstanz, Germany, CHRISTIAN SCHÖNENBERGER, Dept. of Physics and Astronomy, University of Basel, Klingelbergstr. 82, CH-4056 Basel, Switzerland — We consider electronic current transport through a ballistic one-dimensional quantum wire connected to two ferromagnetic leads. We study the effects of the *spin-dependence* of interfacial phase shifts (SDIPS) acquired by electrons upon scattering at the boundaries of the wire. The SDIPS produces a spin splitting of the wire resonant energies which is tunable with the gate voltage and the angle between the ferromagnetic polarizations. This property could be used for manipulating spins. In particular, it leads to a giant magnetoresistance effect with a sign tunable with the gate voltage and the magnetic field applied to the wire.

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