247. Title: Nonadiabatic generation of a pure spin current in a one-dimensional quantum ring with spin-orbit interaction

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Abstract: We demonstrate the theoretical possibility of obtaining a pure spin current in a 1D ring with spin-orbit interaction by irradiation with a nonadiabatic, two-component terahertz laser pulse, whose spatial asymmetry is reflected by an internal phase difference phi. The solutions of the equation of motion for the density operator are obtained for a spin-orbit coupling linear in the electron momentum (Rashba) and they are used to calculate the time-dependent charge and spin currents. We find that there are critical values of phi at which the charge current disappears, while the spin current reaches a maximum or a minimum value.