

Abstract Submitted
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Adiabatic quantum pumping in an Aharonov-Bohm loop and in a Si-like nanowire: interference in real space and in k-space SUNGJUN KIM, Department of Physics, The Pennsylvania State University, University Park, PA, KUNAL DAS, Department of Physics, Fordham University, Bronx, NY, ARI MIZEL, Department of Physics, The Pennsylvania State University, University Park, PA — We study interference effects in the current generated by adiabatic quantum pumping in two extended chain models. The first model contains an Aharonov-Bohm loop within a tight-binding chain of sites. It exhibits interference between the two arms of the loop. We investigate the effect of magnetic field reversal on the pumped current. Our second model is a tight-binding chain of sites with next-nearest-neighbor hopping terms. The resulting Si-like indirect band structure can have 4 degenerate Fermi wave vectors $\pm k_{1F}$ and $\pm k_{2F}$ rather than the usual 2 Fermi wave vectors $\pm k_F$. It exhibits signatures of interference between these degenerate conduction band states.

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