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Quantum charge pumping in graphene nanoribbons[1] TEJINDER KAUR, Ohio University, LILIANA ARRACHEA, Universidad de Buenos Aires, Argentina, NANCY SANDLER, Ohio University — The mechanism to generate DC currents in open-quantum systems by applying local de-phased time-dependent potentials is known as charge pumping. For graphene ribbons, pumping techniques provide an alternative route for current production that overcomes the role of contacts. We have analyzed the properties of zero-bias current through graphene nanoribbons using a tight-binding Hamiltonian description and the Keldysh formalism, which provides the proper description for these systems in the quantum non-equilibrium regime. After reviewing results for quantum pumping in a one-dimensional chain attached to two reservoirs, with two local single-harmonic potentials oscillating in time, we will introduce results for finite-width ribbons of square and graphene lattices. A discussion on the differences in transmission functions and DC currents between these two cases will be presented and the role of edge termination in graphene ribbons will be addressed.

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