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Floquet Spectrum and Transport Through an Irradiated Graphene Ribbon[1] H.A. FERTIG, ZHENGHAO GU, Indiana University, DANIEL AROVAS, University of California, San Diego, ASSA AUERBACH, Technion — Graphene subject to a spatially uniform, circularly-polarized electric field supports a Floquet spectrum with properties akin to those of a topological insulator, including non-vanishing Chern numbers associated with bulk bands and current-carrying edge states. Transport properties of this system however are complicated by the non-equilibrium occupations of the Floquet states. We address this by considering transport in a two-terminal ribbon geometry for which the leads have well-defined chemical potentials, with an irradiated central scattering region. We demonstrate the presence of edge states, which for infinite mass boundary conditions may be associated with only one of the two valleys. At low frequencies, the bulk DC conductivity near zero energy is shown to be dominated by a series of states with very narrow anticrossings, leading to super-diffusive behavior. For very long ribbons, a ballistic regime emerges in which edge state transport dominates.

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