Edge States in Graphene[1] NIKOLAI SINITSYN, Department of Physics, The University of Texas, Austin, JASON HILL, HONGKI MIN, ALLAN H. MACDONALD, Department of Physics, The University of Texas, Austin — We investigate edge states in graphene subject to both realistically described spin-orbit coupling and an external magnetic field. Localized edge states are responsible for the charge and spin transport when the electron chemical potential is in a gap of the bulk spectrum. We derive expressions for the edge state energy dispersions and wave functions both analytically and numerically and discuss specific features that distinguish them from conventional edge states due to magnetic field in electron gas. Finally we discuss the relationship between edge state characteristics and both spin and charge response functions.

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