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**Electron-electron and spin-orbit interactions in armchair graphene ribbons**[1] MAHDI ZAREA, NANCY SANDLER, Ohio University — The effects of intrinsic spin-orbit and Coulomb interactions on low-energy properties of finite width graphene armchair ribbons are studied by means of a Dirac Hamiltonian. It is shown that metallic states subsist in the presence of intrinsic spin-orbit interactions as spin-filtered edge states, in contrast with the insulating behavior predicted for graphene planes. A charge-gap opens due to Coulomb interactions in neutral ribbons, that vanishes as $\Delta \sim 1/W$, with a gapless spin sector. Weak intrinsic spin-orbit interactions do not change the insulating behavior. Explicit expressions for the width-dependent gap and various correlation functions are presented.

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