Abstract Submitted
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Electric-field induced modification of Landau levels in graphene nanoribbon[1] HSIEN-CHING CHUNG, Department of Physics, National Cheng Kung University, YUAN-CHENG HUANG, Center for General Education, Kao Yuan University, MING-FA LIN, Department of Physics, National Cheng Kung University — The low energy magneto-ectronic properties of one-dimensional graphene nanoribbons are investigated by the Peierls tight-binding model with uniform magnetic and electric fields. They are mainly determined by the quantum confinement effects and the external fields. Magnetic fields result in the Landau levels (LLs), lead to the Landau wavefunctions, and enhance partial flat bands. Electric fields significantly modify the dispersionless LLs, change the band symmetry, induce more band-edge states, split the partial flat bands, and drastically alter the distribution of wavefunctions. The density of states directly reflects the main features of energy bands, such as the numbers, frequencies, heights and divergence forms of prominent peaks, which can be confirmed experimentally. The magneto-optical absorption spectra are predicted to be dramatically changed under the influence of external electric fields.

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