

Deformed graphene

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We propose two deformed versions of the graphene tight-binding model under a magnetic field: the first one is obtained by replacing bosonic with pseudo-bosonic operators, while the other is constructed by inserting a suitable deformation parameter V in the original two-by-two Hamiltonian. Both these versions involve non Hermitian Hamiltonians. We analyze the structure of the spectra and the eigenvectors of the Hamiltonians around the K and K' points. In particular, we show that, when $V \neq 0$, the completeness of the eigenvector sets is lost. We also discuss the biorthogonality of the eigenvectors.