Resonant modes in strain-induced graphene superlattices

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After reviewing electronic transport across a strained graphene sheet [1,2], we consider tunneling across a strain-induced superlattice in graphene. In studying the effect of applied strain on the low-lying Dirac-like spectrum, both a shift of the Dirac points in reciprocal space, and a deformation of the Dirac cones is explicitly considered. The latter corresponds to an anisotropic, possibly non-uniform, Fermi velocity. Along with the modes with unit transmission usually found across a single barrier, we analytically find additional resonant modes when considering a periodic structure of several strain-induced barriers. We also study the band-like spectrum of bound states, as a function of conserved energy and transverse momentum [3]. Such a strain-induced superlattice may thus effectively work as a mode filter for transport in graphene.

References

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