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| Thesis Title | Birefringent Dirac Fermion in Anisotropic Velocity Modulated Graphene Junction |
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## Abstract

The tilt-mismatch effect on resonant tunneling through an electrical potential barrier in an asymmetrically-tilted Dirac cone junction was investigated. By varying barrier height, the angle-selective transmission of resonant tunneling oscillate as a function of gate voltage, and the linear phase shifted due to the increase in the tilt parameter. We found that the signature of the tilt parameter can be determined by measuring the tunneling transport properties across the tilt-mismatch junction. For a tilt-homogeneous junction, the tilt-induced pseudo-magnetic effect can occur only when an electric potential is applied to the system. However, the systems with asymmetrically-tilted energy dispersion relation also can mimic the pseudo-magnetic barrier structure without the electric potential. This result opens the opportunity for the tilted Dirac cone system's magnetic focusing applications in electron-optics without magnetism.


Keywords : Pseudo-Magnetic Effect / Quantum Transport / Tilted Dirac Cone