

Abstract Submitted
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Landau level splitting in rotationally faulted multilayer graphene

HRIDIS PAL, MARKUS KINDERMANN, Georgia Institute of Technology — In this work we explore theoretically whether the interlayer motion of electrons in rotationally faulted multilayer graphene can break the valley degeneracy. We show that in the presence of a magnetic field and interlayer commensurations this is indeed possible. It leads to the splitting of Landau levels linear in the field. Our theoretical work is motivated by a recent experiment [1] on epitaxially grown multilayer graphene where a splitting of Landau levels was observed. This Landau level splitting was found to be linear in the field at moderate fields. We consider both bilayer and trilayer configurations and find that in both cases a linear splitting can occur. The predicted lack of valley degeneracy is due to a simultaneous breaking of time-reversal symmetry and inversion symmetry by the magnetic field and interlayer commensurations, respectively. [1] Y. J. Song, et al., Nature 467, 185 (2010).

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