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Semiclassical Analysis of Landau levels Near the van Hove Singularity in Twisted Bilayer Graphen[1] CHI-KEN LU, HERBERT FERTIG, Physics Department, Indiana University, Bloomington, Indiana 47405, USA — We investigate the energy spectrum for electrons in twisted bilayer graphene in the presence of a weak magnetic field. Twisted bilayers host Dirac points from each layer that are near one another in the Brillouin zone, and are coupled through low energy saddle points. In the absence of a field these lead to a low energy van Hove singularity in the density of states. With the field, in a semiclassical picture, electrons orbit in momentum space on contours of constant band energy which may approach the saddle points. The orbits undergo an interesting change in topology as the energy passes from below to above the van Hove singularity energy, going from loops that separately surround each Dirac point to a single loop surrounding *neither*. This contrasts with the more standard situation in which the latter orbit surrounds both low energy orbit centers. The consequences for the Landau level spectrum of this unusual topological transition will be discussed.

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