Shubnikov-de Haas oscillations of the anomalous Hall conductivity

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Measurements of the Shubnikov–de Haas oscillations of the Hall resistivity provide an additional information on transport phenomena, but normally they are much weaker than the oscillations of the diagonal resistivity. Employing a model of two-dimensional massive Dirac fermions that exhibits anomalous Hall effect, we analytically demonstrate that the amplitude of the Shubnikov-de Haas oscillations of the anomalous Hall conductivity is the same as that of the diagonal conductivity. We argue that the oscillations of the anomalous Hall conductivity can be observed by studying the valley Hall effect in graphene superlattices, the anomalous Hall effect in topological insulators, and the spin Hall effect in the low-buckled Dirac materials.