

Abstract Submitted
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Anomalous Magnetic Response of Two-Dimensional Materials VALERI KOTOV, SANGHITA SENGUPTA, University of Vermont, OLEG SUSHKOV, University of New South Wales — The magnetic response of atomically thin materials with Dirac spectrum and spin-orbit interactions can show strong dependence on electron-electron interactions. While graphene itself has very small spin-orbit coupling, various 2D compounds "beyond graphene" are good candidates to exhibit the strong interplay between spin-orbit and Coulomb interactions. Materials in this class include dichalcogenides (such as MoS_2 and WSe_2), silicene, germanene, as well as 2D topological insulators described by the Kane-Mele model. We present a unified theory for their in-plane magnetic field response leading to "anomalous", i.e. electron interaction-dependent g-factors. Therefore our predictions can be used to construct unique magnetic probes with high sensitivity to electron correlations.

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