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Quantum anomalous Hall effect in Co or Rh doped graphene[1] JUN HU, RUQIAN WU, Univ of California - Irvine, RUQIAN WU'S GROUP TEAM — The recent discovery of topological insulators (TIs)—that act as insulator in the bulk yet possess quantized conducting edge or surface states—has triggered extensive interests in the field of condensed matter physics and materials science. One of the most interesting phenomena related to TIs is the quantum anomalous Hall effect (QAHE). Although there are a lot of theoretical predictions about the existence of the QAHE in different materials, the QAHE has been observed only in Be2Se3 so far, in an extreme experimental condition bellow 0.1 K due to the tiny TI gap. On the contrary, it was found that huge TI gaps can be induced in graphene by transition metal adatoms. In the present work, we predict that deposition of sparse Co or Rh adatoms on graphene can produce a TI gap of 37 or 100 meV around the Fermi level. Furthermore, we demonstrate that the QAH state is very robust, due to the strong perpendicular magnetic anisotropies.

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