

Abstract Submitted
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Magnetic interaction and magnetic fluctuations in topological insulators with ordered and disordered magnetic adatoms MAIA G. VERGNIORY, Max Planck Institute of Microstructure Physics, Halle, Germany, LEVAN CHOTORLISHVILI, Institut für Physik, Martin-Luther-Universität Halle-Wittenberg, Germany, ARTHUR ERNST, VITALI DUGAEV, Max Planck Institute of Microstructure Physics, Halle, Germany, ANDREAS KOMNIK, Institut für Theoretische Physik, Universität Heidelberg, Germany, MIJAIL OTROKOV, EVGUENI CHULKOV, Donostia International Physics Center, Donostia - San Sebastian, Spain, JAMAL BERADKAR, Institut für Physik, Martin-Luther-Universität Halle-Wittenberg, Germany — Using a first-principles Green's function approach we study magnetic properties of the magnetic binary topological insulators Bi_2Se_3 , Bi_2Te_3 and Sb_2Te_3 doped with 3d transition metals. We analyze the magnetic phase for each dopant, the exchange interaction, the Curie temperature and the Bloch spectral function. Furthermore, we observe that the interaction of magnons with surface electrons essentially renormalizes the electron energy spectrum. The renormalized spectrum is nonlinear and can be characterized by a negative effective mass of electrons and holes for any k point different from 0. The electron velocity near the Dirac point depends on the electron-magnon coupling.

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