Indirect exchange interaction in 3D Dirac semimetals\textsuperscript{1} DIEGO MASTROGIUSEPPE, NANCY SANDLER, SERGIO ULLOA, Ohio University — 3D Dirac semimetals are new three-dimensional materials with linear band crossings —Dirac points— at distinctive locations in the Brillouin zone. They are predicted to have fascinating properties such as the chiral anomaly and surface Fermi arcs. Na\textsubscript{3}Bi and Cd\textsubscript{3}As\textsubscript{2} are two prototypical examples that have been characterized experimentally \cite{1}. Breaking of time reversal symmetry splits the Dirac points into Weyl points, which are protected by the underlying crystal symmetry. We study the indirect exchange interaction, between two magnetic impurities in these materials. We present results on the behavior of the interaction as a function of the inter-impurity separation in the Dirac phase. We also analyze the transition into the Weyl phase, by introducing perturbations that can be induced by external fields. \cite{1} Science 343, 864; arXiv:1312.7624; Nat. Commun. 5, 3786; PRL 113, 027603.

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