Abstract Submitted
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Role of symmetries on the indirect interaction between magnetic moments in triangular MoS_2 nanoflakes[1] OSCAR AVALOS-OVANDO, Ohio University, DIEGO MASTROGIUSEPPE, Instituto de Física Rosario (CONICET), SERGIO ULLOA, Ohio University — We study the Ruderman-Kittel-Kasuya-Yosida interaction between magnetic impurities embedded in transition-metal dichalcogenide triangular flakes, via a 3-orbital tight binding model. We consider impurities hybridized to transition-metal sites and also at interstitial points. We find that the interaction is drastically different well inside of the flake and near the edges. The strong spin-orbit interaction in these materials produces an effective Dzyaloshinskii-Moriya exchange interaction that can be sizable and tunable, by taking advantage of the symmetry of the system. The interaction is anisotropic for impurities in the interior of the flake. However, when impurities lie near the edges of the flake, the effective exchange is Ising-like, associated with the presence of d_{z^2}-orbitals dominant at edge states. Other tunable interactions are possible by selecting impurity positions and orbital character of the states in their neighborhood. Our results could provide new ways for controlling the helical long-range order in magnetic atom arrays, including 1D chains.

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