Abstract Submitted
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Classical ground states of magnetic chains with twisted long range interactions in MoS_2 flakes[1] OSCAR ÁVALOS OVANDO, Ohio University, U.S.A., DIEGO MASTROGIUSEPPE, Instituto de Física Rosario, Argentina, SERGIO ULLOA, Ohio University, U.S.A. — Magnetic impurities (MI) embedded in a metal can interact indirectly through the conduction electron host, a mechanism known as Ruderman-Kittel-Kasuya-Yosida (RKKY) interaction. Doped transition metal dichalcogenides (TMDs) can provide carriers with strong spin-orbit coupling, allowing for interesting exchange effects between MIs. A sizable Dzyaloshinskii-Moriya (DM) interaction has been shown to exist [1,2], which is long ranged when the MIs lie on/near a flake edge [3]. This opens the possibility of stable phases in MI assemblies in real TMD samples, even for 1D arrays. The combination of long range interactions and DM terms, leads to helical and strongly frustrated impurity interaction in these chains. We present results for 1D MI chains built near TMD flake edges, and study the role of long-range exchange interactions in determining the ground state configurations of the system. A Monte Carlo search of minimal energy configurations reveals interesting patterns, with characteristics that depend on impurity concentration and TMD doping levels. [1] F. Parhizgar *et al.*, PRB **87**, 125401 (2013). [2] D. Mastrogiuseppe *et al.*, PRB **90**, 161403(R) (2014). [3] O. Ávalos-Ovando *et al.*, PRB **93**, 161404(R) (2016); arXiv:1607.08553; 1610.02142

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