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Magnetic phase diagram of doped MnSi CHETAN DHITAL, MOJAMMEL KAHN, ADAM P. PHELAN, DAVID P. YOUNG, RONGYING JIN, JOHN DITUSA, Louisiana State University — The noncentrosymmetric chiral structure of cubic *B20* compound MnSi favors Dzyaloshinskii-Moria (DM) interaction (D) where the broken inversion symmetry determines direction of D and the strength of spin-orbit coupling determines the magnitude of D. This relatively weak DM interaction D competes against the exchange interaction (J) resulting in rather unusual long wavelength helimagnetism with the period set by the ratio (J/D). Previous work has shown that both helimagnetic period (λ) and the transition temperature (T_C) are reduced as a result of either Fe or Co substitutions on Mn site [1, and references therein]. Recently we have started to investigate the effect on the helimagnetic/Skyrmion structure and the transition temperature by chemical substitutions on the Si site. I will present our preliminary magnetization and neutron scattering results where we have found clear evidence of increase in both T_C and helimagnetic period as a result of doping. The possible connection between carrier doping and the strength of DM interaction strength will be discussed.

1. Bauer, A., et al. "Quantum phase transitions in single-crystal Mn $_{1-x}$ Fe $_x$ Si and Mn $_{1-x}$ Co $_x$ Si: Crystal growth, magnetization, ac susceptibility, and specific heat." *Physical Review B* 82.6 (2010) .

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