

Abstract Submitted
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Diverging Nematic Susceptibility, Physical Meaning of T^* scale, and Pseudogap in the Spin Fermion Model for Pnictides SHUHUA LIANG, ANAMITRA MUKHERJEE, NIRAVKUMAR PATEL, CHRIS BISHOP, ELBIO DAGOTTO, ADRIANA MOREO, Univ of Tennessee, Knoxville — Using Monte Carlo simulations including the lattice degree of freedom [1], for the first time the nematic susceptibility of the spin fermion model for the pnictides is calculated [2]. The results are in very good agreement with experiments by J-H. Chu et al., Science 337, 710 (2012). Our study suggests a nematicity in the spin fermion model primarily originating on magnetism, but with the lattice/orbital also playing an important role by boosting up critical temperatures and separating the structural T_S and Néel T_N transitions. At $T > T_S$, Curie-Weiss behavior is observed with a characteristic temperature T^* being the T_N of the purely electronic system. In this regime, a pseudogap in the density of states and short-range magnetic order is observed.

[1] S. Liang et al., PRL 111, 047004 (2013)

[2] S. Liang et al., arXiv:1405.6395 (2014), to appear in PRB.

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