Abstract Submitted
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Spin and Orbital Nematic Susceptibility of Iron Based Superconductors[1] CHRISTOPHER BISHOP, SHUHUA LIANG, ANAMITRA MUKHERJEE, NIRAVKUMAR PATEL, ELBIO DAGOTTO, ADRIANA MOREO, Univ of Tennessee, Knoxville — The spin and orbital nematic susceptibility of the iron-based superconductors are calculated in the undoped limit using a three-orbital (xz, yz, xy) spin-fermion model that includes spin, orbital, and lattice degrees of freedom [1]. The results are in very good agreement with experiments by J-H. Chu et al., Science 337, 710 (2012). Recently, Raman scattering experiments[2] indicate a Curie-Weiss behavior of the orbital nematic susceptibility in $BaFe_2As_2$ and $Sr(Fe_{1-x}Co_x)_2As_2$. This behavior is observed in our numerical simulations after considering the coupling between the spin and orbital nematic order parameters. A Landau-Ginzburg formalism is used to analytically derive equations for both the spin and orbital susceptibility that fit well the numerical data. [1] S. Liang et al., arXiv:1405.6395 (2014), to appear in PRB. [2] Y.-X. Yang, et al., "Raman scattering as a probe of charge nematic fluctuations in iron based superconductors," *JPS Conf. Proc. 3 , 015001*, 2014.

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