

Abstract Submitted
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Effect of P-doping in FeAs compounds DAO-XIN YAO, University of Tennessee and ORNL, WEI-FENG TSAI, Purdue University, SHUHUA LIANG, University of Tennessee, JIANGPING HU, Purdue University, ELBIO DAGOTTO, University of Tennessee and ORNL — We studied the effect of quenched disorder on the magnetic transition of the frustrated J1-J2 Heisenberg model. It was shown that the model qualitatively explains the experimental behavior of the antiferromagnetic (AF) transition with increasing phosphorus substitution of arsenic in CeFeAsPO. [1] We assume that the introduction of P atoms reduces the effective magnetic interaction strength along both parallel and diagonal iron-iron bonds. When the bond dilution reaches the critical point, the percolation occurs and the system enters the disordered state from the magnetically ordered antiferromagnet. Both the Ising and Heisenberg cases are studied. We find that the P-dependence of the iron AF ordering temperature and the magnetic moment are close to the experimental data. Implications of this effect on superconductivity are also discussed.

[1] C. de la Cruz et al. arXiv:0907.2853

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