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Effect of SDW order fluctuations on the specific heat jump in iron pnictides DUSHKO KUZMANOVSKI, Department of Physics, University of Wisconsin, Madison, WI, ALEX LEVCHENKO, Department of Physics and Astronomy, Michigan State University, East Lansing, MI, MAXIM KHODAS, Department of Physics and Astronomy, University of Iowa, Iowa City, IA, MAXIM VAVILOV, Department of Physics, University of Wisconsin, Madison, WI — A conjecture about existence of a quantum critical point beneath a superconducting dome has recently attracted attention to the properties of iron-based pnictide superconductors (FeSC) near optimal doping. Spin-density wave fluctuations in the vicinity of the critical point are expected to significantly affect thermodynamics properties of FeSC, including magnetic penetration depth, effective mass, and specific heat. We study the effect of thermal fluctuations of the SDW order on the specific heat jump at the onset of superconducting transition in the iron-based superconductors (FeSCs) based on the minimal two-band model. We find that, beyond mean-field level, the discontinuity of $\Delta C/T_c$ at the tetra-critical point (the end point of the coexistence phase) transforms into a sharp peak. We demonstrate that specific heat jump scales not simply logarithmically with $x - x_c$, as expected for the quantum critical behavior, but it acquires an even more singular power-law dependence. We fit to the experimental data from P. Walmsley *et al.*, Phys. Rev. Lett. **110**, 257002 (2013) including this additional term, and the increased goodness of fit suggests significant importance of the latter effect.

Dushko Kuzmanovski
Department of Physics, University of Wisconsin, Madison, WI

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