

Abstract Submitted  
for the MAR13 Meeting of  
The American Physical Society

**Effect of doping on the specific heat jump in iron-based superconductors**<sup>1</sup> DUSHKO KUZMANOVSKI, SAURABH MAITI, MAXIM VAVILOV, ANDREY CHUBUKOV, University of Wisconsin - Madison, Madison, WI, USA, FREDERIC HARDY, Karlsruhe Institute of Technology, Institute for Solid State Physics, 76021 Karlsruhe, Germany — In this talk we present a theoretical description of the jump of the specific heat at the transition to a superconducting phase of iron-based pnictides. We discuss both the overdoped regime, when the transition occurs between non-magnetic and superconducting phases, and the underdoped regime, when superconductivity emerges from a pre-emptive SDW phase. Both effects lead to a qualitatively similar phase diagram as a function of doping, but details differ. We presume that doping simultaneously modifies the Fermi surface of pnictides and introduces disorder. By fitting the transition temperatures for the SDW and SC phases, we establish the relative strengths of the the rigid band shift caused by doping and doping-induced disorder. We then evaluate the specific heat jump as a function of doping. Our theory is consistent with measurements made by Karlsruhe group of the specific heat jump in  $\text{BaFe}_2\text{As}_2$  compounds with K- and Co-doping.

<sup>1</sup>NSF-DMR 0955500

Dushko Kuzmanovski  
University of Wisconsin - Madison, Madison, WI, USA

Date submitted: 09 Nov 2012

Electronic form version 1.4