Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

Ginzburg-Landau theory of layered superconductors: application to iron pnictides[1] JAMES MURRAY, ZLATKO TESANOVIC, Department of Physics and Astronomy, Johns Hopkins University, Baltimore, MD 21218 — We use the Ginzburg-Landau approach for a layered superconductor with a Josephson coupling between the layers to study the effects of fluctuations in recently discovered iron-based high temperature superconductors. While such effects are theoretically well understood in three- and particularly in two-dimensional systems, the special challenge posed by iron pnictides is their layered but still effectively three dimensional character. Using an approximation devised for this particular situation, we derive theoretical expressions for the fluctuation contributions to the free energy, magnetization, specific heat, and electrical conductivity. We compare our results with recent experimental data on the iron pnictide superconductors.

[1]Research supported in part by the DOE under Grant No. DE-FG02-08ER46544.

James Murray
Johns Hopkins University

Date submitted: 19 Nov 2009 Electronic form version 1.4