

Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

Raman spectra of Fe-pnictide superconductors including the effect of disorder¹ G.R. BOYD, P.J. HIRSCHFELD, University of Florida, T.P. DEVEREAUX, Stanford University and SLAC — The nature of the superconducting state in the Fe-pnictide materials is still an open question. Data from NMR, penetration depth, ARPES, and other techniques support nodal or fully gapped states depending on the probe, the doping, and which member of the iron pnictide family is being measured. Recent Raman scattering measurements on Cobalt doped barium-122 for different dopings provide evidence of gap nodes which are removed with increasing Co content. Here we report calculations of the Raman intensity in extended s-symmetry superconducting states and an electronic structure appropriate for the Fe-pnictide materials. Including disorder treated in the T-matrix approximation, we show how intraband scattering can lift the nodes and provide an explanation for the data in various polarizations. We give predictions for the evolution of these spectra with further disorder.

¹Partial support was provided by DOE DE-FG02-05ER46236.

Greg Boyd
University of Florida

Date submitted: 19 Nov 2009

Electronic form version 1.4