Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

Spin-orbit coupling in Fe-based superconductors[1] M.M. KORSHUNOV, Department of Physics, University of Florida, Gainesville, Florida 32611, USA, I. EREMIN, Institut fuer Theoretische Physik III, Ruhr-Universitaet Bochum, D-44801 Bochum, Germany, P.J. HIRSCHFELD, Department of Physics, University of Florida, Gainesville, Florida 32611, USA — The recently discovered iron-based superconductors have attracted considerable attention mainly for their unconventional pairing state. In connection with the determination of pairing symmetry, the resonance peak observed in neutron scattering experiments [1] agrees well with predicted results for the extended s-wave ($s_{\pm}$) gap symmetry [2]. However, recent neutron measurements shows that there is anisotropy in the spin resonance [3]. In particular, S^zS^z component is different from S^+S^- component of the dynamical spin susceptibility. Such breaking of the spin-rotational invariance in the spin-liquid phase without long-range order can occur due to spin-orbit (SO) coupling. We study the role of the SO coupling in the multiorbital model for Fe-pnictides, and discuss how it influences spin resonance feature and the relation to SC pairing.

[1]. A.D. Christianson *et al.*, Nature **456**, 930 (2008). [2]. M.M. Korshunov and I. Eremin, Phys. Rev. B **78**, 140509(R) (2008); T.A. Maier and D.J. Scalapino, *ibid*, 020514(R) (2008). [3]. O.J. Lipscombe *et al.*, Phys. Rev. B **82**, 064515 (2010).

[1]Partial support was provided by DOE DE-FG02-05ER46236 (PJH)

Maxim Korshunov
Dept of Physics, University of Florida, Gainesville, Florida 32611, USA

Date submitted: 23 Dec 2010 Electronic form version 1.4