## Abstract Submitted for the MAR16 Meeting of The American Physical Society

Superconductivity and spin excitations in orbitally ordered FeSe<sup>1</sup> ANDREAS KREISEL, Niels Bohr Institute, Denmark, SHANTANU MUKHERJEE, Niels Bohr Institute, Denmark; State University of New York at Binghamton, USA, P. J. HIRSCHFELD, University of Florida, USA, B.M. ANDERSEN, Niels Bohr Institute, Denmark — We provide a band-structure with low-energy properties consistent with recent photoemission and quantum oscillations measurements on the Fe-based superconductor FeSe[1], including a mean-field like orbital ordering in the  $d_{xz}/d_{yz}$  channel, and show that this model also accounts for the temperature dependence of the measured Knight shift and the spin-relaxation rate[2]. An RPA calculation of the dynamical spin susceptibility yields spin excitations which are peaked at wave vector  $(\pi, 0)$  in the 1-Fe Brillouin zone, with a broad maximum at energies of order a few meV. Furthermore, the superconducting gap structure obtained from spin fluctuation theory exhibits nodes on the electron pockets, consistent with the 'V'-shaped density of states measured by tunneling spectroscopy on this material. The redistribution of spectral weight in the superconducting state creates a  $(\pi, 0)$  "neutron resonance" as seen in recent experiments [3]. Comparing to various experimental results, we give predictions for further studies. [1] S. Mukherjee, et al., PRL 115, 026402 (2015); A. Kreisel, et al., arXiv:1506.03593 [2] S.-H. Baek, et al., Nat. Mater. 14, 210 (2015); A.E. Böhmer, et al., PRL 114, 027001 (2015) [3] M.C. Rahn, et al., PRB 91, 180501 (2015); Q. Wang, et al., arXiv:1502.07544

<sup>1</sup>A.K. and B.M.A. acknowledge financial support from a Lundbeckfond fellowship (Grant No. A9318). P.J.H. was partially supported by the Department of Energy under Grant No. DE-FG02-05ER46236.

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Date submitted: 03 Nov 2015

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