Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

Comparing the specific heat to the cyclotron mass in two dopings of YBCO in the underdoped regime[1] JONATHON KEMPER, Florida State University/NHMFL, SCOTT C. RIGGS, Stanford University, O. VAFEK, Florida State University/NHMFL, A. MIGLIORI, J.B. BETTS, B.J. RAMSHAW, R.D. MCDONALD, F.F. BALAKIREV, Los Alamos Nat'l Lab/NHMFL, R. LIANG, D.A. BONN, University of British Columbia, G.S. BOEBINGER, Florida State University/NHMFL — Two underdoped High T_c superconductors, $YBa_2Cu_3O_{6.51}$ and $YBa_2Cu_3O_{6.56}$, show finite electronic specific heat even in vanishing magnetic field and temperature as well as quantum magneto-oscillations at high magnetic fields. Previous results show the high-field electronic specific heat up to 45 T to be a sum of contributions from superconducting vortices and quantum magneto-oscillations, the latter a signature of an un-gapped Fermi surface. The vortex contribution appears as a smooth square-root field dependence of the Sommerfeld coefficient that shows no sign of diminished superconductivity up to 45 T. We present new results which allow a comparison between the cyclotron mass from high field experiments to the zero field Sommerfeld coefficient in the same crystal. The discussion will include implications of the new results on the interpretation of the previous data.

[1]Work funded in part by the DOE, NSF, and State of Florida.

Jonathon Kemper
Florida State University/NHMFL

Date submitted: 28 Nov 2012 Electronic form version 1.4