Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

Extraction of Normal Electron Self-Energy and Pairing Self-Energy in $Bi_2Sr_2CaCu_2O_8$ via Laser ARPES WENTAO ZHANG, Institute of Physics, Chinese Academy of Sciences, Beijing, China, J.M. BOK, J.H. YUN, Dept. of Physics, SungKyunKwan University, Korea, J.F. HE, G.D. LIU, L. ZHAO, H.Y. LIU, J.Q. MENG, X.W. JIA, Y.Y. PENG, D.X. MOU, S.Y. LIU, L. YU, S.L. HE, X.L. DONG, J. ZHANG, Institute of Physics, CAS, Beijing, China, J.S. WEN, Z.J. XU, Brookhaven National Laboratory, USA, G.D. GU, Brookhaven National Laboratory, USA, C.T. CHEN, Z.Y. XU, Technical Institute of Physics and Chemistry, CAS, Beijing, China, H.-Y. CHOI, Dept. of Physics, SungKyunKwan University, Korea, C.M. VARMA, Dept. of Physics and Astronomy, UC Riverside, USA, X.J. ZHOU, Institute of Physics, CAS, Beijing, China — Super-high resolution laser-based angle-resolved photoemission measurements have been performed on a high temperature superconductor $Bi_2Sr_2CaCu_2O_8$. The band back-bending characteristic of the Bogoliubov-like quasiparticle dispersion is clearly revealed at low temperature in the superconducting state which gives rise to two peaks in the momentum distribution curves. This makes it possible for the first time to experimentally extract the normal electron self-energy and pairing self-energy in the superconducting state. These information can be used to further determine the Bosonic spectral function that will provide key insight and constraints on the origin of electron pairing in high temperature superconductors.

Xingjiang Zhou
Institute of Physics, Chinese Academy of Sciences

Date submitted: 13 Nov 2011 Electronic form version 1.4