Abstract Submitted
for the MAR06 Meeting of
The American Physical Society

Systematic doping evolution of quasiparticle mode and Fermi surface topology in $NaxCoO_2$ DONG QIAN, Department of Physics, Princeton University, A.V. FEDOROV, ZAHID HUSSAIN, Advanced Light Source, Lawrence Berkeley National Laboratory, R.J. CAVA, Department of Chemistry, Princeton University, N.L. WANG, Beijing National Laboratory for Condensed Matter Physics, Institute of Physics, Chinese Academy of Sciences, M.Z. HASAN, Department of Physics, Princeton University — We have carried out a detailed and systematic state-of-the-art photoemission study of $NaxCoO_2$ over a wide range of doping. The Fermi velocity is found to be weakly anisotropic and small leading to a strongly suppressed quasiparticle bandwidth as a universal behavior in all dopings. No surface state or Ruthanate-type reconstruction is observed. Systematic studies show that the 2-D Fermi-surface area evolves according to the Na doping count only below x=0.5. The measured Fermi surface topology near superconducting Na doping kinematically allows for commensurate fluctuations (charge or lattice) as potential competing instabilities. The temperature evolution of quasiparticles will be discussed in addition.

Dong Qian
Prineton University

Date submitted: 04 Dec 2005 Electronic form version 1.4