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Systematic doping evolution of quasiparticle mode and Fermi surface topology in Na_xCoO_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 Na_xCoO_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 Rutanate-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.

Prefer Oral Session
 Prefer Poster Session

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