Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

Charge transfer and electronic structure of graphene and graphite intercalation compounds[1] T. VALLA, J. CAMACHO, Brookhaven National Laboratory, M. H. UPTON, Argonne National Laboratory, Z.-H. PAN, A. V. FEDOROV, Lawrence Berkeley National Laboratory, A. C. WALTERS, C. A. HOWARD, M. ELLERBY, University College London — In graphite intercalation compounds (GIC), layers of different chemical species (intercalants) are introduced between graphene sheets. Due to the charge transfer between the intercalant and graphene layers, intercalation allows a controlled doping of graphene sheets and a broad variation of many physical properties, including the emergence of relatively high transition temperature superconductivity in some GICs. We have studied the changes in the electronic structure of various GICs in angle-resolved photoemission spectroscopy and found that, with the doping of graphene sheets, the electronic correlations become stronger and more anisotropic. In particular, the electron phonon coupling of graphene-derived electronic states with high-frequency graphene-derived vibrations increases dramatically with the amount of charge transfer.

[1]This work was supported by the US Department of Energy and the UK Engineering and Physical Science Research Council

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Date submitted: 21 Nov 2008 Electronic form version 1.4