

Abstract Submitted
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ARPES study of the YBCO phase diagram by in-situ K evaporation D. FOURNIER, G. LEVY, University of British Columbia, J.L. MC-CHEYNEY, A. BOSTWICK, E. ROTENBERG, ALS, LBNL, W.N. HARDY, R.X. LIANG, D.A. BONN, I.S. ELFIMOV, A. DAMASCELLI, University of British Columbia — The study of the YBCO phase diagram by ARPES has become of central interest since the observation of quantum oscillations in high-magnetic field [1]. However, until recently accessing the various electronic phases by photoemission has been hampered by the so-called polar catastrophe [2]. In this work, the overdoped metal (OD, $p=0.37$, $T_c=0$), the superconducting phase (OP, $T < T_c$), and the normal state of the pseudogap regime (UD, $T_c < T < T^*$) have been successfully explored by surface doping (i.e., in-situ K evaporation). This reveals that the dispersion, as well as the arc topology of the low energy excitations of the normal state, are universal [3]. While no traces of an electronic reconstruction have been observed in YBCO, we are able to identify the doping value at which the Luttinger description breaks down upon underdoping.

[1] N. Doiron-Leyraud *et al.*, Nature 447, 565 (2007).

[2] M. A. Hossain *et al.*, Nat. Phys. 4, 527 (2008).

[3] K. M. Shen *et al.*, Science 307, 901 (2005).

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