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Oxygen reduction effects on the electronic structures of electron doped cuprates: investigating the mechanism of the metal insulator transition D.J. SONG, S.R. PARK, C.S. LEEM, CHUL KIM, Y.K. KIM, S.K. CHOI, W.S. JUNG, C. KIM, Yonsei university, H. EISAKI, AIST, D.H. LU, Z.-X. SHEN, Stanford university, S. ISHIDA, S. UCHIDA, University of Tokyo — In electron doped cuprates, oxygen reduction process not only induces superconductivity but also causes changes in many physical properties. In order to understand these oxygen reduction effects, we performed ARPES studies on as-grown and de-oxygenated superconducting electron doped cuprates, PLCCO, NCCO and SCCO. We observe Fermi surface topology change and pseudo gap filling due to weakening of AFM as reported in other studies. In addition, sharp quasi-particles (QP) appear out of broad incoherent features as the as-grown samples are de-oxygenated through the oxygen reduction process. We believe that this behavior of the QP peak closely related to the insulator to metal transition in the reduction process. We attribute the suppression of the QP states in as-grown sample to the Anderson localized electron states due to strong disorder and impurity scattering.

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