

Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

Visualizing **electronic**
segregation in lightly-doped $\text{Ca}_{2-x}\text{Na}_x\text{CuO}_2\text{Cl}_2$ YUHKI KOHSAKA, TETSUO HANAGURI, RIKEN, MASAKI AZUMA, MIKIO TAKANO, Kyoto Univ., J. C. SEAMUS DAVIS, Cornell Univ., HIDENORI TAKAGI, RIKEN/Univ. of Tokyo — We report spectroscopic imaging on evolution of the electronic state in a lightly-doped cuprate superconductor $\text{Ca}_{2-x}\text{Na}_x\text{CuO}_2\text{Cl}_2$ across the metal-insulator critical doping. We find nm-scale electronic segregation between regions breaking and showing the lattice symmetry. The former shows C_2 symmetry characterized by the unidirectional nano-domains and the V-shaped pseudogap found in superconducting samples [1] while the latter shows C_4 symmetry and wider U-shaped gap prominent in non-superconducting samples. This indicates that the local symmetry breaking is inherent in the electronic states created inside the Mott gap by hole doping. We also discuss spectra in C_2/C_4 domains and superconducting/insulating samples.

[1] Y. Kohsaka et al., Science 315, 1380 (2007), Nature 454, 1072 (2008).

Yuhki Kohsaka
RIKEN

Date submitted: 19 Nov 2008

Electronic form version 1.4