

Abstract Submitted  
for the MAR14 Meeting of  
The American Physical Society

**Quantum fluctuations in charge glass manifested by the hysteresis of Hall resistivity** JIE WU, ANTHONY BOLLINGER, YUJIE SUN, IVAN BOZOVIC, Brookhaven National Laboratory — The Hall effect studies on the underdoped  $\text{La}_{2-x}\text{Sr}_x\text{CuO}_4$  films grown by Molecular Beam epitaxy (MBE) show dramatic hysteretic behavior at temperatures below 1.5 K, in agreement with the hypothesis that the low temperature ground state is a Coulomb glass. The fluctuations in the Hall resistivity  $R_H$  reach several hundred percent and even change the sign of  $R_H$ , thus making the Hall effect measurement a very sensitive probe of the glassy state. Using a continuous doping gradient (COMBE), we scanned the dependence of  $R_H$  on the doping level  $x$  in extremely fine steps ( $x < 0.0001$ ), in order to precisely map out the phase boundary between the charge glass state and the superconducting state.

Jie Wu  
Brookhaven National Laboratory

Date submitted: 12 Nov 2013

Electronic form version 1.4