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 La_{2-x}Sr_xCuO_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.