



	Experiment title: Charge order and correlations in a clean overdoped cuprate superconductor	Experiment number: HC/4162
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Report:

Charge order and correlations in a clean overdoped cuprate superconductor

Recent RIXS studies on $(\text{Bi,Pb})_{2.12}\text{Sr}_{1.88}\text{CuO}_{6+\delta}$ (Bi2201) and $\text{La}_{2-x}\text{Sr}_x\text{CuO}_4$ (LSCO) have shown that charge order (CO) persists throughout the phase diagram of high temperature cuprate (HTC) superconductors and, in particular, through the overdoped region. The two compounds studied so far are relatively disordered and scattering is known to strongly suppress the transition temperature and superfluid density. Here we proposed to search for charge order and charge correlations in the overdoped region in the cleaner system $\text{Tl}_2\text{Ba}_2\text{CuO}_{6+\delta}$ (Tl2201) which has a different Fermi surface topology to LSCO and reduced quasiparticle scattering. The results will shed light on the mechanism of charge ordering.

We measured the charge order and CDW fluctuations at the Cu L-edge. Three samples were investigated with dopings $p=0.23, 0.25$ and 0.28 . With T_c 's in the range 55-15K. The experiment was a great success: two of the dopings $p=0.23, 0.25$ showed charge density wave (CDW) correlations while the highest doping $p=0.28$ did not.

