

# Experimental report

29/08/2017

**Proposal:** TEST-2473

**Council:** 10/2014

**Title:** Field induced magnetism in super-oxygenated LSCO+O

**Research area:**

**This proposal is a new proposal**

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**Samples:** La,Sr)2CuO4+y

Instrument	Requested days	Allocated days	From	To
THALES	7	7	04/05/2015	11/05/2015
IN3	1	1		

**Abstract:**

# Report of neutron scattering exp. on THALES

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May 19, 2015

## 1 Introduction

This experiment was performed at ThALES, ILL and is a continuation of the experiments performed at IN12 in 2013, and FLEXX in 2015. We got friendly user time, exp.TEST-2473. The experiment ran from 3/5 2015 to 12/5 2015. Present were Kim Lefmann (3/5-7/5), Monica Lacatusu (3/5-12/5), Henrik Jacobsen (4/5-10/5), Sonja Lindahl Holm (6/5-12/5) and Linda Udby (8/5-11/5).

Two experiments were performed: 1) measurement of the position of the incommensurate (IC) peaks in oxygen-doped  $\text{La}_2\text{CuO}_{4+y}$ . 2) Field dependence of the IC signal in strontium- and oxygen-doped  $\text{La}_{2-x}\text{Sr}_x\text{CuO}_{4+y}$ . Here, only the first experiment will be described.

We had a 3.44 g single crystal of LCO+O in the beam, labeled S1.

We measured both the elastic and inelastic signal near  $(1 + \delta, \pm\delta, 0)$ , with  $\delta \approx 0.11$ . An example of a scan is shown in Fig. 1.

The elastic data was fitted to two Gaussians on a quadratic background, while the inelastic data was fitted to two Gaussians on a flat background. The most important result of the fit, the peak position, is shown in Fig. 2.

It is here clearly seen that the elastic and inelastic peaks are not at the same position. Having done grid scans and measuring both peaks we eliminate the concern that the results are a resolution effect.

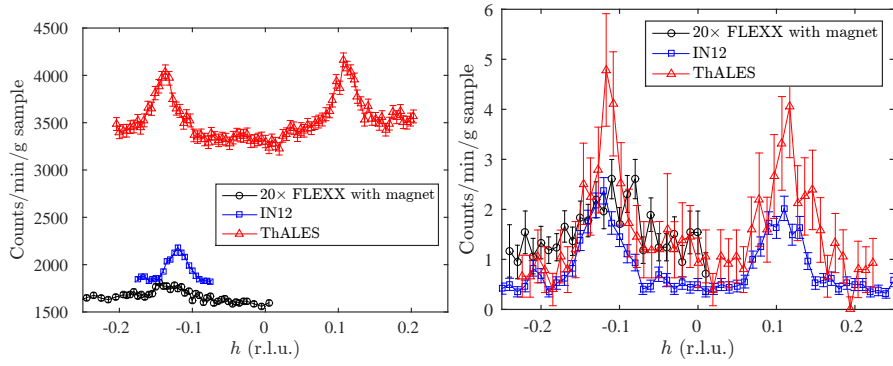


Figure 1: Example of data from this experiment. Left: elastic scattering. Right: inelastic scattering. For comparison, data from previous experiments are also shown.

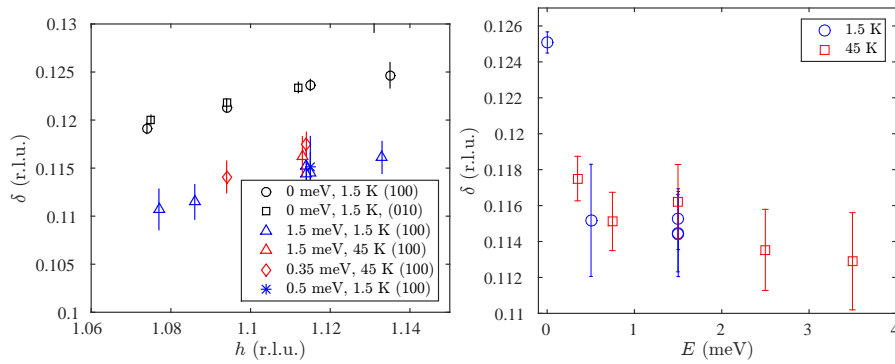


Figure 2: Half of the distance between the two peaks. A clear shift is seen between the elastic and inelastic data.