Experimental report

15/09/2019

Proposal: 5-54-275 **Council:** 10/2018

Title: The magnetic structure of underdoped Fe1+xTe – Collinear or canted moments?

Research area: Physics

This proposal is a new proposal

Main proposer: Chris STOCK

Experimental team: Edmond CHAN
Chris STOCK
Manila SONGVILAY

Local contacts: Anne STUNAULT
Navid QURESHI

Samples: Fe1.07Te

Instrument	Requested days	Allocated days	From	To
D3	4	0		
IN20	0	4	30/08/2019	03/09/2019

Abstract:

Recent scanning tunnelling measurements have found evidence for a canted collinear magnetic structure in Fe1.07Te. This is different from neutron diffraction measurements, however such measurements have been based on an intensity analysis of relatively few magnetic peaks. To resolve this issue, we propose to measure the magnetic structure using cryopad. This will determine if microscopy measurements are measuring a surface effect or the bulk.

STM measurements on Fe1+xTe with a small amount of interstitial iron observe a non collinear and canted magnetic structure. However, neutron diffraction on powders report a collinear magnetic structure. To determine if this due to a surface reconstruction we applied polarized neutrons to measure the magnetic structure in Fe1+xTe with the same concentrations measured with STM. We find a collinear structure within less than 0.1 degrees. This is compared to a canting reported by STM of 28 degrees.