Experimental report

14/05/2024

Proposal: EASY-571 **Council:** 10/2019

Title: Complimentary measurements on Cu2OSeO3

Research area: Physics

This proposal is a new proposal

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Samples: Cu2OSeO3

Instrument	Requested days	Allocated days	From	To
D33	48	48	20/01/2020	22/01/2020

Abstract:

Magnetic skyrmions are topological spin textures modulated in two dimensions to form circular particle-like objects. Significant interest in them arises from numerous possible technological applications, such as in computer memory or microwave devices. Recent advances have shown a wide range in magnetic field where Bloch skyrmions in Cu2OSeO3 exist as a metastable state. An important fundamental question about the properties of skyrmions is how they distort when the magnetic field is changed, and these advances open up a wide enough field range to study this effect for both Bloch and Néel skyrmions. We propose to study this distortion using small angle neutron scattering by measuring higher order diffraction peaks that will only occur when the modulation of the spin texture becomes non-sinusoidal. These measurements will allow an important comparison of the fundamental properties of the two main types of magnetic skyrmions, informing future research into technological applications.

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The experiment was a success. Rich phase diagram of magnetic structures discovered.