Experimental report

04/05/2022

Proposal: 5-31-2799 **Council:** 4/2020

Title: Magnetic Structure of a potential umbrella-type chiral non-coplanar ferrimagnet

Research area: Physics

This proposal is a new proposal

Main proposer: Bella LAKE

Experimental team: Clemens RITTER

Local contacts: Clemens RITTER

Samples: Co(NO3)2

Instrument	Requested days	Allocated days	From	To
D2B	2	0		
D20	2	2	19/05/2021	21/05/2021

Abstract:

Low-dimensional and frustrated magnetic systems can realize exotic spin liquid ground states or form peculiar types of long-range magnetic order. Among systems of particular interest are those characterized by frustrated triangular motifs in two dimensions. The implementation of either ordered or disordered ground states in triangular, honeycomb or kagome lattices are dictated by competition of exchange interactions as well as anisotropy and the spin value of magnetic ions. While low-spin Heisenberg systems may arrive at the quantum spin liquid state, the high-spin Ising systems may establish static non-collinear magnetically ordered structures. Here, we propose to investigate the magnetic structure of the new magnetic material cobalt (II) dinitrate, Co(NO3)2, where physical properties measurements, XANES and ESR in combination with ab initio calculations suggest a chiral non-coplanar umbrella-type ferrimagnet with comparable spin and orbital contributions to the total magnetic moment.

The data analysis is ongoing