

Experimental report

16/09/2026

Proposal: 4-05-847

Council: 4/2021

Title: Exploring Spin Correlations in a Frustrated Quantum Magnet by Neutron Spin-Echo

Research area: Physics

This proposal is a resubmission of 4-05-799

Main proposer: Lucy CLARK

Experimental team: Peter FOUQUET

Local contacts: Peter FOUQUET

Samples: Cu₂(OD)₆FBr

Instrument	Requested days	Allocated days	From	To
WASP	6	6	10/06/2021	16/06/2021

Abstract:

The low-dimensionality and magnetic frustration of the $S = 1/2$ kagomé antiferromagnet give rise to unusual physical phenomena in materials that realise this corner-sharing triangular network of magnetic moments. Here, we will follow the evolution of magnetic correlations in one such material, barlowite, which contains a kagomé network of Cu²⁺ $S = 1/2$ ions using neutron spin-echo. In particular, we seek to understand whether dynamical spin correlations persist within its low-temperature magnetic state.

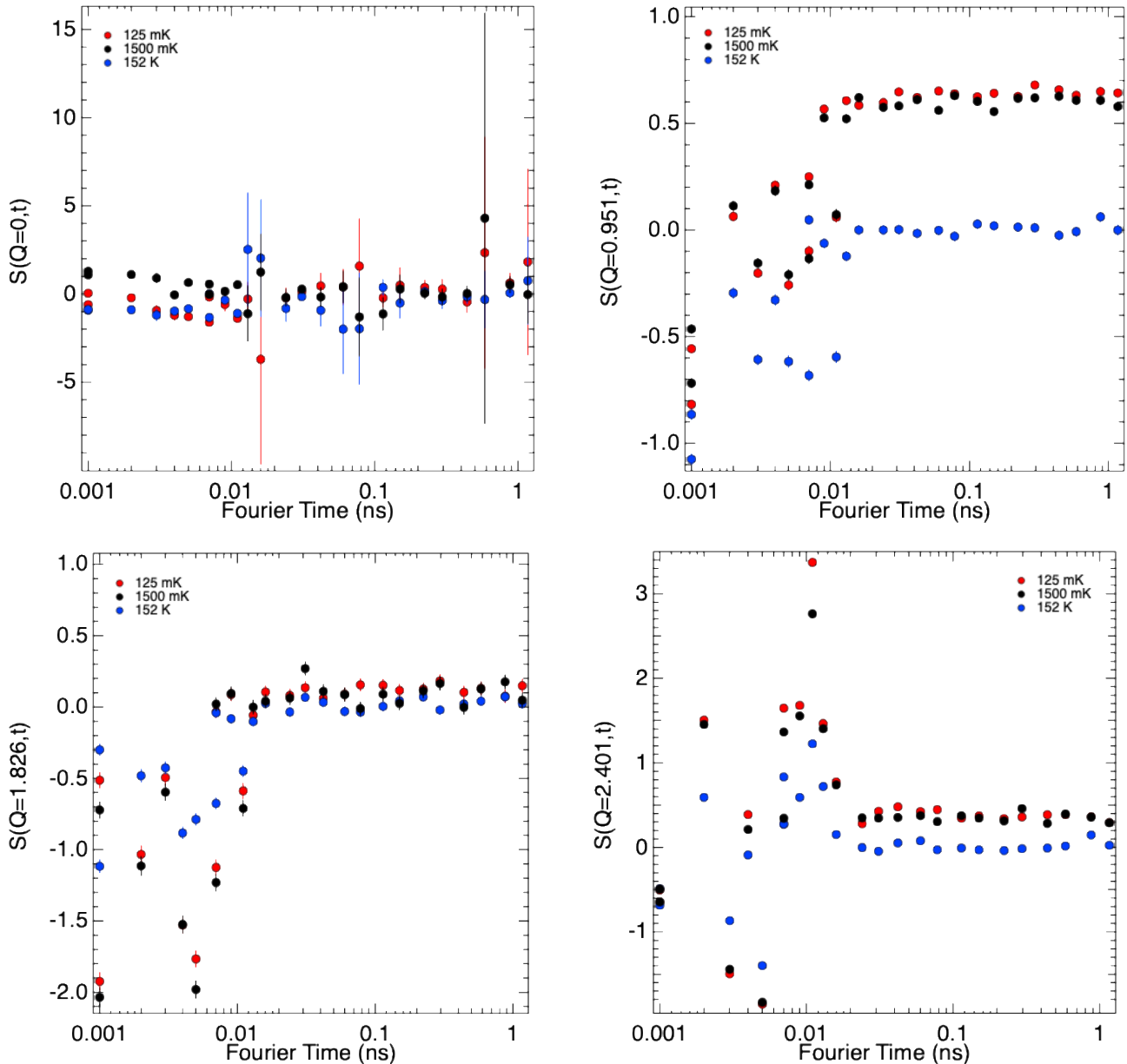
Spin-echo study of beta-Mn

Ross Stewart, Lucy Clark

A magnetic spin-echo experiment was attempted on pure beta-Mn metal in order to characterise the low energy, low temperature spin-fluctuations, and to possibly identify a spin-freezing transition which was previously hinted at via muon spin-relaxation at temperatures < 1 K.

This experiment was conducted remotely by Peter Fouquet and Peter Falus.

The magnetic echo as a function of temperature and Q (for 3 Q bins) is plotted below.



The magnetic signal was extremely small in this experiment, and isolation of the magnetic scattering was hampered by the presence of a small amount of MnO impurity – which nevertheless resulted in a large magnetic Bragg peak at $Q = 1.2 \text{ \AA}^{-1}$. Therefore, confirmation of the frozen magnetic ground state was not possible from this experiment on WASP.