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Scaling behaviour of the skyrmions lattices in Cu2OSeO3 single crystals from small angle neutron scattering

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Skyrmions are topologically protected spin vortices in the nanometre scale that behave like particles. In chiral crystals, competing magnetic interactions may induce 2D skyrmion lattices [1-2]. In the multiferroic insulator Cu_2OSeO_3, the skyrmion lattice responds to electric/magnetic fields suggesting applications in data storage [3]. These applications crucially depend on the stability conditions of the skyrmion phase. Notably, Cu_2OSeO_3 is the only material in which the appearance of two different skyrmion phases has been reported in its phase diagram. However, the quantum mechanisms of these phases and their thermodynamic connection are still under debate [4-6]. Hence, we used Small Angle Neutron Scattering and Lorentz Transmission Electron Microscopy to study the skyrmion stabilisation in single crystals of Cu_2OSeO_3 [7]. In this work, we report the field, temperature, and sample alignment dependence of the scaling behaviour of skyrmions as an order parameter for the emergence of the two skyrmion phases.

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Level of Expertise

Student

Presenter Gender

Man

Pronouns

Which facility did you use for your research

Australian Centre for Neutron Scattering

Students Only - Are you interested in AINSE student funding

Yes

Do you wish to take part in the Student Poster Slam

No

Condition of submission

Yes

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