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Solving Multi-q Incommensurate Magnetism in a Europium Triangle Lattice Material

Friday, 13 December 2024 12:30 (20 minutes)

Recently, centrosymmetric lanthanide metals have been the subject of intense research due to the discovery of skyrmions in materials such as Gd_2PdSi_3, $GdRu_2Si_2$, $Gd_3Ru_4Al_{12}$, $EuAl_4$, and $EuNiGe_3$. In this talk, I will present work on a europium triangle lattice compound in this family. Through spherical polarimetry using CRYOPAD at ThALES and polarized SANS measurements at D33, we demonstrate the existence of one single-q cycloidal and two multi-q vortex lattice states with unusually low symmetry propagation vectors. These unusual propagation vectors motivated the development of new SANS data visualization and analysis tools. I will also discuss how these states are deeply intertwined with the electronic structure of the material, and what insights this may provide for the design of new multi-q materials.

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