

Abstract Submitted
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Transverse field muon-spin rotation in skyrmion-hosting materials TOM LANCASTER, FAN XIAO, ROBERT WILLIAMS, Durham University, ZAHER SALMAN, Paul Scherrer Institut, STEPHEN BLUNDELL, University of Oxford, FRANCIS PRATT, STFC ISIS Facility, IORWERTH THOMAS, Durham University, MONICA CIOMAGA HATNEAN, GEETHA BALAKRISHNAN, University of Warwick, SHILEI ZHANG, THORSTEN HESJEDAL, University of Oxford — We present the results of transverse field (TF) muon-spin rotation (μ^+ SR) measurements on examples of materials that host a skyrmion lattice (SL) phase. In measurements on bulk Cu_2OSeO_3 , we measure the response of the TF μ^+ SR signal in the SL phase along with the surrounding ones, and suggest how the phases might be distinguished using the results of these measurements. Dipole field simulations support the conclusion that the muon is sensitive to the SL via the TF lineshape and, based on this interpretation, our measurements suggest that the SL is quasistatic on a timescale $\tau > 100$ ns. We also discuss TF μ^+ SR measurements on an epitaxially grown 40 nm-thick film of MnSi on Si(111) in the region of the field-temperature phase diagram where a skyrmion phase has been observed in the bulk. We identify changes in the quasistatic magnetic field distribution sampled by the muon, along with evidence for magnetic transitions around $T \approx 40$ K and 30 K. Our results suggest that the cone phase is not the only magnetic texture realized in film samples for out-of-plane fields.

Tom Lancaster
Durham University

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