

Poster-1-6

Anomalous magnetic domain patterns in Kagome semimetal Co₃Sn₂S₂Hengli Duan,¹ Sandy Adhitia Ekahana,¹ Yuran Niu,² and Yona Soh¹¹ Paul Scherrer Institut, Villigen PSI 5232, Switzerland² MAX IV Laboratory, Lund University, Lund 22100, Sweden

Investigating magnetism in topological materials reveals intriguing correlations between magnetic and electronic states, notably in the magnetic Weyl semimetal Co₃Sn₂S₂, which features a cobalt ion kagome lattice [1-4]. This work employs Lorentz mirror electron microscopy (L-MEM) and X-ray magnetic circular dichroism photoemission electron microscopy (XMCD-PEEM) to explore the temperature- and field-dependent dynamics of magnetic domains in Co₃Sn₂S₂. We observe spontaneous magnetic bubbles of tens of micrometers under zero-field and minimal-field cooling conditions, illustrating an intrinsic exchange bias effect as seen in M-H curves via SQUID. The asymmetric domain evolution during field-cooling and warming processes offers a microscopic view into the thermomagnetic hysteresis observed in M-T curves. Furthermore, the field-dependent behaviors of these magnetic bubbles suggest the potential existence of hybrid domain walls. This research contributes to our understanding of the complex magnetic phenomena in Co₃Sn₂S₂.

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