Exploration of Topological Magnetic Objects at Interfaces using Resonant Elastic X-Ray Scattering

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A major challenge in topological magnetism lies in the three-dimensional (3D) exploration of their magnetic textures. A recent focus has been the question of how 2D skyrmion sheets vertically stack to form distinct types of 3D topological strings, what happens to these strings when they are clamped at an interface, how these topological objects couple across interfaces of dissimilar materials, and how these states can be further manipulated?

In this talk, I will present an overview of the capabilities of polarization- and energy-dependent resonant elastic x-ray scattering (REXS) for the study of three-dimensional structural variations of magnetic skyrmions [1-4] and related topological objects, such as chiral bobber lattices [5], hybrid skyrmions [6], and the folding and unfolding of magnetic skyrmion strings [7].

References

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Figures

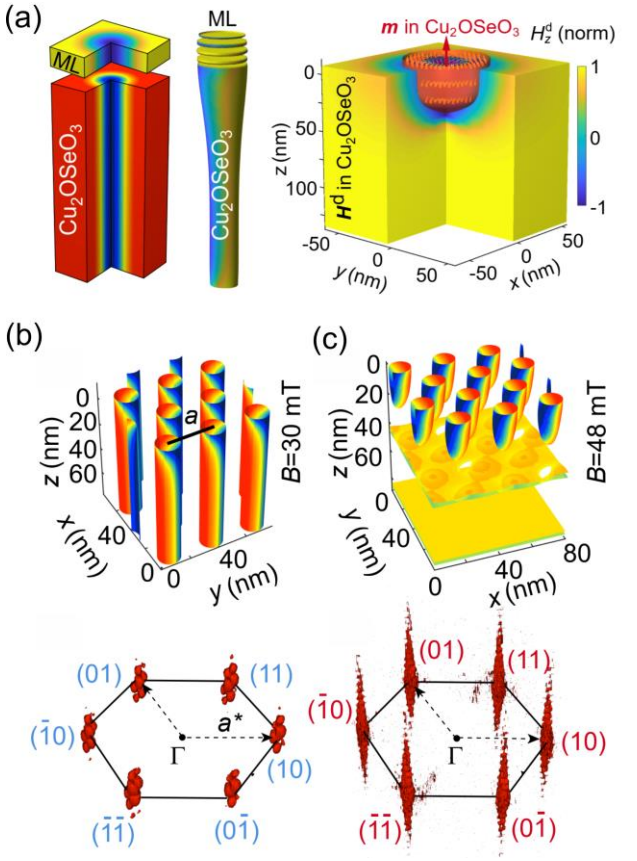

Figure 1: (a) Creation of a chiral bobber structure via heterostructure engineering by joining two different skyrmion species with comparable lateral dimensions. (b) Magnetic truncation rod analysis of (b) skyrmions and (c) chiral bobbers.