

Visualizing the Fingerprint Spin Texture of Altermagnets at Atomic Scale

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The defining feature of an altermagnet lies in the specific crystal symmetry C (rotation and/or mirror), which connects opposite-spin sublattices in real space and enforces C -paired spin-momentum locking (SML) in momentum (k) space. However, experimental studies to date have relied primarily on global measurements of the consequent phenomena, and the definitive feature of altermagnetism has evaded these spatially averaged probes. In this talk, I will review the recent progress on the study of altermagnetism using scanning tunneling microscopy, and show how the unique spin texture can be revealed by atomic-scale spectroscopic imaging. I will then focus on a newly developed atomic-scale spin probe based on “topological” STM tip, and show its application to a layered altermagnetic material KV_2Se_2O which allow us to directly image the defining alternating spin texture in both real and momentum space.