

Spin-Splitting in Collinear Antiferromagnetic MnTe : Inception and Manifestations

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Abstract. Kramers spin degeneracy in antiferromagnets has been a topic of intense research in condensed matter physics. Centrosymmetric MnTe is an ideal antiferromagnetic candidate challenging the fundamental understanding and significance of Kramers spin degeneracy. We have attempted to explore this electronic spin degeneracy by investigating the spin-polarized electronic structure of MnTe by means of one-step model Angle Resolved Photoemission (ARPES) calculations within the fully relativistic multiple scattering Korringa-Kohn-Rostoker–Green function approach. The spectral weight distribution in photon energy dependent calculations clearly establishes a non-symmorphic symmetry between magnetic sublattices in MnTe. The results are also used to discuss surface effects and to identify clear signatures corresponding to the surface resonance contributions from Te and Mn states at respective binding energies. The excellent agreement of the spin-split ARPES band structure calculations with experiments reveals that the spin splitting stems from the local crystal anisotropy without requiring strong electronic correlations¹.

REFERENCES

¹J. Krempaský *et al.*, Nature **626**, 517–522 (2024)