First micro-ARPES measurements of encapsulated few-layer T_d-$MoTe_2$

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Thinning a bulk material down to few atomic layers or even to a monolayer influences its physical properties considerably. In this project, we plan to study the thickness dependent electronic structure of $MoTe_2$ in its orthorhombic T_d phase with broken inversion symmetry. Bulk T_d-$MoTe_2$ is a type-II Weyl semimetal with topological Fermi arc surface states and becomes superconducting at a low critical temperature of $T_c = 0.1\,K$. Remarkably, superconductivity becomes far more robust in the 2D limit, contrary to generic models and the established trend in ultrathin metal films [1]. Recent transport measurements reported an increase in T_c for decreasing thickness with T_c reaching $7.6\,K$ in the monolayer [2]. The reasons for the strong increase in T_c as well as the nature of the superconducting state remain unknown. Here, we will present preliminary micro-focus ARPES measurements of exfoliated few-layer $MoTe_2$ encapsulated between graphite and graphene to protect the flakes from degradation. We will discuss the device fabrication technique as well as first insights into the thickness dependent electronic structure.

[1] Daejin Eom *et al.* Phys. Rev. Lett. **96**, 027005 (2006).

[2] Daniel A. Rhodes *et al.* Nano Letters **21** (6), 2505-2511 (2021).