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【162】 Bulk electronic and local magnetic properties of semiconducting 2H-molybdenum ditelluride

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Layered transition metal dichalcogenides are intensively investigated due to their rich optoelectronic, superconducting and topological properties and their potential usage as mono-layer building blocks. Surprisingly, in semiconducting 2H-MoTe₂ long-range magnetic order of unknown origin has recently been observed [1]. Here we present the full 3D band structure of 2H-MoTe₂, determined with soft X-ray ARPES. We find a pronounced k_z dispersion in most bands, consistent with ab-initio calculations. Furthermore, we present results of beta detected ⁸Li NMR measurements and show that the spin-lattice relaxation of the implanted Li ions is inconsistent with ferromagnetic order. Instead, our results suggest a magnetic structure that is coupled antiferromagnetic across the van der Waals gap.

[1] Z. Guguchia, et. al., *Sci. Adv.* **4**, eaat3672 (2018)

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