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【612】Low-energy band structure of Weyl-II candidate MoTe2: a view from infrared spectroscopy

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1T'-MoTe2 is a layered, van der Waals material, which has recently been proposed to host Weyl fermions, linked to the tilted Dirac cones in its band structure. In this transition metal dichalcogenide, very fine energy scales play an important role. However, the precise low-energy structure of these bands has so far been experimentally elusive, due to a complex coexistence of several electronic bands at the Fermi level.
We address the electrodynamics in MoTe2 by exploring its temperature-dependent infrared properties. We identify two pronounced low-lying interband excitations, one of whom strongly shifts with temperature. Using a simple theoretical approach, we can discern the characteristics of the bands crossing the Fermi level, helping to demystify the band structure of 1T'-MoTe2.

Authors: Prof. AKRAP, Ana (University of Fribourg); Dr SANTOS-COTTIN, David (University of Fribourg); MARTINO, Edoardo (EPFL); Mr LE MARDELÉ, Florian (University of Fribourg); Dr VON ROHR, Fabian (Department of Chemistry, University of Zürich); Dr RUKELJ, Zoran (University of Zagreb)

Presenter: Prof. AKRAP, Ana (University of Fribourg)

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