

Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Optical Properties and Band Gap of Single- and Few-Layer MoTe₂ Crystals¹ OZGUR BURAK ASLAN, Columbia Univ, CLAUDIA RUPPERT, Technische Universität Dortmund, TONY HEINZ, Columbia Univ — Single- and few-layer crystals of exfoliated MoTe₂ have been characterized spectroscopically by photoluminescence, Raman scattering, and optical absorption measurements. We find that MoTe₂ in the monolayer limit displays strong photoluminescence. On the basis of complementary optical absorption results, we conclude that monolayer MoTe₂ is a direct-gap semiconductor with an optical band gap of 1.10 eV. This new monolayer material extends the spectral range of atomically thin direct-gap materials from the visible to the near-infrared.

¹Supported by the NSF through Grant DMR-1124894 for sample preparation and characterization by the Office of Naval Research for analysis. C.R. acknowledges support from the Alexander von Humboldt Foundation

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Date submitted: 12 Nov 2014

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