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Magnetotransport Measurements of Thin Layered WTe2 BOSONG SUN, ZAIYAO FEI, SANFENG WU, JOE FINNEY, PAUL NGUYEN, University of Washington, JIAQIANG YAN, Oak Ridge National Laboratory, TAUNO PALOMAKI, XIAODONG XU, DAVID COBDEN, University of Washington — Tungsten Telluride, a semimetallic layered transition-metal dichalcogenide, was recently found to have extremely large magnetoresistance at helium temperatures. The unconventional non-saturating behavior may be related to near-perfect charge compensation between electron and hole pockets, but this is still debated. Since that discovery there have been several studies of angle-resolved photoemission and quantum transport on the bulk material which found the fermi surface to be rather complex. It is clear that insights stand to be gained from the variation of the properties on thinning down to a single monolayer. Measurements of thin exfoliated crystals have indicated that the carriers become increasingly localized on approaching the monolayer limit. This may be an intrinsic feature or it may be a result of the disorder produced by oxidation of the surface layers. We report transport measurements on few-layer and monolayer WTe2 with and without encapsulation in hBN, including the dependence on thickness, crystal axis, temperature, gate voltage and magnetoresistance, which resolve this question.

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