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Transport properties of the Dirac type-II semi-metal candidate $PtTe_2$ QIONG ZHOU, DANIEL RHODES, YU-CHE CHIU, KUAN-WEN CHEN, WENKAI ZHENG, RICO SCHÖNEMANN, National High Magnetic Field Laboratory and Florida State University, ERIK KAMPERT, TOBIAS FÖRSTER, Dresden High Magnetic Field Laboratory, THOMAS MARTIN, JULIA CHAN, Department of Chemistry, University of Texas, Dallas, LUIS BALICAS, National High Magnetic Field Laboratory and Florida State University — We investigated the electronic structure and transport properties via the temperature and angular dependence of the Shubnikov-de Haas (SdH) and de Haas van Alphen (dHvA) effect in single crystals of the semi-metallic platinum ditelluride ($PtTe_2$), recently claimed to be a novel type-II Dirac semimetal. Our high-quality $PtTe_2$ crystal displays non-saturating and large magnetoresistance at magnetic field up to 9 T. The dHvA oscillation reveals up to 8 frequencies suggesting a rather complex Fermi surface with evidence for a non-trivial Berry phase. The crystal quality improved considerably under subsequent annealing at high-temperatures leading to the observation of linear in field magnetoresistivity. Combined with effective masses in the order of ~ 0.1 free electron mass, these results further suggest that $PtTe_2$ displays bulk Dirac-like bands. Hall-effect measurements suggest that this compound is not a compensated semi-metal.

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