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**Electronic Transport through Grain Boundaries in Monolayer Molybdenum Disulfide Grown by Chemical Vapor Deposition**  
DANIEL CHENET, AREND VAN DER ZANDE, Columbia University, PINSHANE HUANG, Cornell University, YUMENG YOU, TIMOTHY BERKELBACH, Columbia University, GWAN-HYOUNG LEE, Samsung-SKKU Graphene Center (SSGC), Suwon, Korea, DAVID REICHMAN, Columbia University, DAVID MULLER, Cornell University, TONY HEINZ, JAMES HONE, Columbia University — Monolayer molybdenum disulfide is a new direct bandgap semiconductor that has recently received significant attention for its potential utility in two-dimensional electronics. Recent advances in the large-area synthesis of this material by chemical vapor deposition are accelerating the device concept to realization process. However, little is currently known about the effect of growth defects on electronic transport in this material. Here, we have optimized the synthesis process to grow large single crystals up to 120  $\mu\text{m}$  in size with electrical and optical properties comparable or superior to that of exfoliated samples. When these single crystals grow together to form large continuous sheets, the inevitable consequence is the formation of grain boundaries that should have different electrical properties than the bulk. With our ability to rapidly identify well-faceted single crystals and the boundaries between them by optical microscopy, we fabricate field effect transistors to measure the effects of individual grain boundaries on channel conductivity and mobility.

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