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Magneto-optical studies on an atomically-thin van der Waals ferromagnetic semiconductor BEVIN HUANG, GENEVIEVE CLARK, Univ of Washington, EFREN NAVARRO-MORATALLA, DAHLIA KLEIN, Massachusetts Institute of Technology, RAN CHENG, Carnegie Mellon University, KYLE SEYLER, EMMA SCHMIDGALL, Univ of Washington, MICHAEL MCGUIRE, Oak Ridge National Laboratory, DAVID COBDEN, Univ of Washington, WANG YAO, University of Hong Kong, DI XIAO, Carnegie Mellon University, PABLO JARILLO-HERRERO, Massachusetts Institute of Technology, XIAODONG XU, Univ of Washington — The increasing need for computational power and data storage demands novel materials to improve existing technology. Ferromagnetic (FM) semiconductors are promising materials to simultaneously control charge and spin ordering, and provide a method to electrically control spin-active devices. Atomically thin van der Waals materials exhibit a variety of technologically relevant phenomena in a truly two-dimensional platform. Ferromagnetism or FM semiconductivity in 2D materials, however, has yet to be demonstrated. Recent studies suggest the possible existence of 2D FM semiconductors in single-layer chromium trihalides. Here, we discuss our magneto-optical measurements on chromium triiodide (CrI_3) to determine its magnetic ordering as a function of layer thickness, magnetic field, and temperature.

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