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Influence of hydrostatic pressure on the diluted magnetic semiconductor $Sb_{2-x}Cr_xTe_3$ ANDREW J. LUCIANA, Department of Physics, John Carroll University, CESTMIR DRASAR, PETR LOSTAK, Faculty of Chemical Technology, University of Pardubice, Czech Republic, JEFFREY S. DYCK, Department of Physics, John Carroll University — Currently, there is a great deal research activity on the incorporation of magnetic ions into semiconductors to produce ferromagnetism. These diluted magnetic semiconductors (DMSs) are of interest both to theorists, because of their unusual mechanisms of magnetic behavior, and to experimentalists, because the manipulation of spin in addition to charge promises devices based on spin polarized transport. We have investigated electrical transport properties of bulk single crystals of the ferromagnetic DMS $Sb_{2-x}Cr_xTe_3$ under varying pressure (0 GPa to 1.2 GPa), temperature (2 K to 300 K), and magnetic fields (0 T to 6 T). High pressure measurements afford a reversible way to tune both the electronic structure and magnetic interactions of these materials. Assuming a Curie temperature T_C model based on RKKY indirect spin exchange we seek to observe how pressure and carrier concentration relate to the T_C in this material. We show that both T_C and carrier concentration exhibit increasing trends as hydrostatic pressure is increased. This work was supported by the Research Corporation.

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