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Effect of pressure on spin-carrier interactions in $Sb_{2-x}V_xTe_3$ and $Sb_{2-x}Cr_xTe_3$ single crystals[1] MATTHEW L. BOWERS, JEFFREY S. DYCK, John Carroll Univ., CESTMIR DRASAR, PETR LOSTAK, University of Pardubice, Czech Republic — Bulk, single crystal samples of diluted magnetic semiconductors $Sb_{2-x}Cr_xTe_3$ and $Sb_{2-x}V_xTe_3$ are being studied in an effort to understand the electrical and magnetic mechanisms that cause these and other similar DMS materials to undergo a ferromagnetic transition at low temperature. By taking advantage of the fact that hydrostatic pressure alters the carrier concentration in these materials, our aim is to examine the carrier-mediated magnetic interactions at work. Electrical resistivity and Hall effect measurements were made as a function of temperature and pressure for a variety of samples with varying concentration of magnetic impurity. The results show that the Curie temperature is increased for values of x = 0.08 in Cr-doped samples, and was decreased for x = 0.02 or 0.03 for both Cr- and V-doped samples. A model based on the full oscillatory nature of the RKKY interaction, incorporating the pressure dependence of both carrier concentration and magnetic impurity separation, has been developed for comparison to our experimental results.

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