Hall effect in magnetic semiconductor InMnSb epitaxial thin films
NIKHIL RANGARAJU, NIDHI PARASHAR, BRUCE WESSELS, Materials Research Center and Department of Materials Science and Engineering, Northwestern University — The magnetotransport properties of ferromagnetic $In_{1-x}Mn_xSb$ semiconductor films with $x=0.01$ to 0.035 were measured from 1.5 K to 298K and magnetic fields up to 18T. The vapor phase epitaxial films are p-type with a hole concentration of $10^{19} \text{cm}^{-3}$ and mobility of $10^2 \text{cm}^2/\text{Vs}$. The Hall resistivity is described by the equation $\rho_{xy} = R_0B + R_AM$ where $R_0$ and $R_A$ are the normal and anomalous hall coefficients, $B$ is the applied magnetic field and $M$ is the magnetization. The films exhibited an anomalous Hall effect over entire temperature range. It was observed that $R_A$ is proportional to the longitudinal resistivity ($\rho_{xx}$) leading to a magnetoresistance dependant Hall voltage.