Abstract Submitted
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Temperature-Dependent Weak Field Hall Resistance in 2D Carrier Systems THEODORE CASTNER[1], University of Rochester — Das Sarma and Huang [1] have attempted to explain the T- dependent Hall coefficient $R_H(T)$ of Gao et al. [2] for the 2D GaAs hole system solely with the T-dependent Hall factor $r_H(T) = <\tau^2>/<\tau>^2$. They employed $R_H = r_H(T)/en$ with n the total hole density which is independent of T. However $r_H = 1$ at T=0 and $r_H > 1$ at finite T. Thus $r_H(T)$ cannot explain the observed decrease of $R_H(T)$ with increasing T. Employing the known relation $R_H(T) = r_H/ep_i(T)$, where $p_i(T)$ is the itinerant hole density, one can explain the decrease in R_H with increasing T with $p_i(T)$ increasing faster than $r_H(T)$. Using the mobility data $[\mu(T)\ \alpha <\tau>]$ one can determine $r_H(T)$, which differs from the calculated curves in [1] in that it is asymmetrical about $r_{H,max}$. Using the Hall data and $r_H(T)$ inferred from the data one can obtain the increase in $p_i(T)$ with T and compare it with calculations of $p_i(T)$ done with Fermi Liquid theory taking account of the soft Coulomb gap in the density-of-states. This approach gives good agreement, but doesn't take account of inhomogeneity. Other features of the Gao et al. data will be discussed. 1. S. Das Sarma and E.H. Huang, Phys.Rev.Lett.95, 0164011 (2005) 2. X.P.A. Gao et al., Phys.Rev.Lett.93, 256402 (2004)

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