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Influence of temperature on mobility and carrier density of InN films JAGDISH THAKUR, Wayne State University, V.M. NAIK, University of Michigan-Dearborn, R. NAIK, D. HADDAD, G.W. AUNER, Wayne State University, H. LU, W.J. SCHAFF, Cornell University — We have investigated temperature dependence of Hall mobility and carrier density for thin InN films with low and high carrier density grown by Molecular Beam Epitaxy (MBE) and Plasma Source Molecular Beam Epitaxy (PSMBE), respectively. At very low temperatures, a large concentration of carriers which are temperature independent is observed in both the low and high density films. However, the behavior of mobility for the low density film is different from that of the high density film particular for temperatures less than 300K. For the low density film, mobility increases with temperature and passes through a maximum around 250 K in contrast to temperature independent mobility observed for the high density film for T<300K. Theoretically, we investigated the temperature dependence behavior of the mobility using Born-scattering and found the presence of charged dislocation in the low density film. At higher temperatures the mobility is determined by the electrons scattering from the longitudinal-optical (LO) phonons.

Jagdish Thakur
Wayne State University

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