Abstract Submitted
for the MAR05 Meeting of
The American Physical Society

Effects of Stoichiometry on Electrical and Optical Properties of InN JOHNNY C. HO, PETRA SPECHT, XIAOYU XU, QUING YANG, WILLIAM HONG, EICKE R. WEBER, Dept. of Materials Science, UC Berkeley — Indiumnitride is the least developed semiconductor among the group III – nitride compounds. Although the commonly produced material has high defect concentrations it already exhibits high electron mobility which indicates a great potential for future high speed electronic applications. Recently, a series of research efforts has been focused on the clarification of the fundamental bandgap of InN. The variations in the bandgap measurements were mainly attributed to the Burstein-Moss energy shift, the presence of oxide precipitates, possible indium clusters and other stoichiometry related effects. The influence of the indium to nitrogen flux ratio on the electrical and optical properties of InN, grown by molecular beam epitaxy (MBE) is systematically investigated and presented in this paper. A sudden increase in the electron concentration was observed for the highest indium flux. Simultaneously, a red shift in the photoluminescence peak energy was recorded. A correlation of these findings with changes in the materials chemistry and/or the presence of defects such as indium clusters will be presented.

Eicke Weber
UC Berkeley

Date submitted: 06 Jan 2005 Electronic form version 1.4