Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

Thermopower of n- and p-type InN NATE MILLER, Lawrence Berkeley National Lab, Univ. of California - Berkeley, JOEL AGER, Lawrence Berkeley National Lab, REBECCA JONES, HOLLAND SMITH, Lawrence Berkeley National Lab, Univ. of California - Berkeley, KIN MAN YU, Lawrence Berkeley National Lab, EUGENE HALLER, Lawrence Berkeley National Lab, Univ. of California - Berkeley, WLADEK WALUKIEWICZ, Lawrence Berkeley National Lab, WILLIAM SCHAFF, Cornell University, CHAD GALLINAT, GREGOR KOBLMULLER, JIM SPECK, Univ. of California – Santa Barbara — The exceptionally large (> 5.5 eV) electron affinity of InN leads to unique electronic properties such as surface electron accumulation and an extreme propensity for n-type conduction. This, combined with a small energy gap and strongly energy dependent effective mass, makes an analysis of charge transport and determination of band structure parameters an arduous task. In this work we show that thermopower (Seebeck coefficient) measurements can address some of the issues by providing a new tool to study the unique charge transport properties of InN and In-rich group III-nitride alloys. Our thermopower experiments are used to demonstrate the presence of mobile holes in Mg-doped InN providing the first direct, quantitative measurement of hole transport in InN. We also report modeling of the thermopower of n-type InN considering the various scattering mechanisms.

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Date submitted: 21 Nov 2008 Electronic form version 1.4