Abstract Submitted
for the MAR05 Meeting of
The American Physical Society

Vibrational spectroscopy of N-H2 complexes in GaPN S. KLEEKAJAI, M. STAVOLA, W.B. FOWLER, M. CAPIZZI, A. POLIMENI, C.W. TU, K. MARTIN, Lehigh University — The dilute III-N-V alloys have attracted much recent attention because of a large reduction of the band-gap energy that occurs for N concentrations of a few percent. The hydrogenation of these alloys gives rise to an increase of the band-gap energy, eliminating the effect of N [1]. Vibrational spectroscopy provides a powerful probe of the structures of the important N- and H- containing complexes in these materials. A previous study of the vibrational properties of GaAsN:H showed that the dominant N- and H-containing defect contains two weakly coupled N-H oscillators, a result that is inconsistent with an H_2* configuration that several theoretical groups have suggested to explain the properties of H in GaAsN and GaPN [2]. New results from an IR study of the N- and H-containing defects that are produced in GaPN by hydrogenation have led to a better understanding of the vibrational properties of N-H_2 complexes in the III-N-V alloys. This work is supported by NSF Grant DMR 0403641. 1. A. Polimeni *et al.*, Phys. Rev. B **63**, 201204 (R) (2001). 2. F. Jiang *et al.*, Phys. Rev. B **69**, 041309 (R) (2004).

Suppawan Kleekajai

Date submitted: 22 Dec 2004 Electronic form version 1.4