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Persistent Photoconductivity and Magnetotransport in Dilute Nitride Semiconductor Alloys R.L. FIELD III, Y. JIN, C. KURDAK, Physics Department, R.S. GOLDMAN, Department of Material Science and Physics Department, University of Michigan, Ann Arbor, MI 48109 — Nitrogen related defects, such as N interstitials and Si-N complexes, are known to dominate electrical and optical properties of dilute nitride semiconductor alloys [1,2]. We investigate the dependence of these defects on N incorporation for MBE grown Si and Te-doped dilute GaAs_{1-x}N_x ($x = 0.75-1.9$) alloys. Persistent photoconductivity was observed for these heterostructures as high as 160 K, with photo-capture barriers from 216-350 meV. Also, carrier concentrations extracted from Hall measurements reveal a T-independent regime above 150 K and a strong thermally-activated regime below 150 K. These two phenomena are reminiscent of the behavior of n- type AlGaAs, suggesting the presence of similar N-induced DX- center-like states in GaAsN. We will discuss the dependence of these energies on both N composition and annealing temperature.

- [1] Y. Jin *et al.*, Appl. Phys. Lett. 95, 092109 (2009).
[2] Y. Jin *et al.*, Appl. Phys. Lett. 95, 062109 (2009).

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