Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

**Origins of Persistent Photoconductivity in Highly Mismatched Semiconductor Alloys** R.L. FIELD III, Department of Physics, University of Michigan, G. VARDAR, Department of Materials Science and Engineering, University of Michigan, Y. JIN, Department of Physics, University of Michigan, T. DANNECKER, Tyndall National Institute, University College Cork, Y.Q. WANG, Materials Science and Technology Division, Los Alamos National Laboratory, C. KURDAK, Department of Physics, University of Michigan, R.S. GOLDMAN, Department of Materials Science and Engineering, University of Michigan
— Persistent photoconductivity (PPC) is a nonequilibrium phenomenon in which an illumination-induced increase in conductivity of a semiconductor persists following the termination of illumination. The PPC effect has been explained in terms of the large-lattice-relaxation (LLR) model, in which photoexcited carriers are unable to relax to equilibrium due to an energy barrier between shallow donor and deep donor complex (DX) center configurations. To date, an experimental identification of atomistic configurations in support of a model for the PPC effect has yet to be reported. Here, we examine the origins of the PPC effect in GaAsN alloy films, providing the first direct correlation between the concentration of interstitials and the strength of the PPC effect. Thus, the PPC effect in GaAsN is attributed to a change in the bond orientation or a shift in the center of mass of either N-N or N-As pairs. Similar investigations of GaAsBi alloy films will be discussed.

Richard Field III
Department of Physics and Materials Science and Engineering,
University of Michigan, Ann Arbor, MI

Date submitted: 13 Dec 2011 Electronic form version 1.4