

Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

Space-and-Time-Resolved Spectroscopy of Single GaN Nanowires

PRASHANTH UPADHYA, Los Alamos National Laboratory, JULIO MARTINEZ, QIMING LI, GEORGE WANG, BRIAN SWARTZENTRUBER, Sandia National Laboratories, ANTOINETTE TAYLOR, ROHIT PRASANKUMAR, Los Alamos National Laboratory — Understanding the carrier relaxation pathways in individual semiconductor nanowires (NWs) is crucial, since the geometry of these nanostructures can significantly influence carrier recombination and trapping. In particular, GaN NWs are promising wide bandgap semiconductors for applications in nanophotonics, but the efficiency and lifetime of GaN-based devices are largely affected by the presence of structural and point defects. In this study we employ wavelength-tunable femtosecond optical pump-probe spectroscopy to study carrier relaxation through the defect states responsible for yellow luminescence in both a single GaN NW and NW ensembles. These are the first ultrafast optical experiments on single group III-V NWs, revealing spatially resolved carrier dynamics along the length of an individual wire.

Rohit Prasankumar
Los Alamos National Laboratory

Date submitted: 17 Nov 2010

Electronic form version 1.4