Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

Demonstration of amber-green light emitting diodes with lattice-mismatched AlInP active region THERESA CHRISTIAN, University of Colorado, Boulder, DANIEL BEATON, National Renewable Energy Laboratory, KUNAL MUKHERJEE, Massachusetts Institute of Technology, KIRSTIN ALBERI, ANGELO MASCARENHAS, National Renewable Energy Laboratory, EUGENE FITZGERALD, Massachusetts Institute of Technology — Future solid-state lamps based on all-LED white light emission will require four emitter colors (red, amber, green, and blue) to achieve good color rendering while maintaining high efficiency. Traditional LED material systems are well-suited to the red and blue ends of the spectrum but there is not yet a clear front-runner material for efficient light emission in the amber-green wavelength range (570 – 595 nm). The compound semiconductor alloy $Al_xIn_{1-x}P$ has the potential to achieve this target due to its high direct bandgap. This talk will present results from our recent fabrication of amber-green LEDs featuring an AlInP double-heterostructure device structure. Cladding layers for carrier confinement are achieved through control of atomic ordering in the AlInP material. To fully exploit the high direct bandgap that occurs at lattice constants below that of GaAs, these devices are grown on InGaAs/GaAs virtual substrates. Devices are characterized in terms of current-voltage behavior, electroluminescence emission spectra and drive current dependence.

Theresa Christian
University of Colorado, Boulder

Date submitted: 11 Dec 2012 Electronic form version 1.4