Abstract Submitted
for the MAR05 Meeting of
The American Physical Society

Nitride Deep Ultraviolet Light-Emitting Diodes with Microlens Array KHIZAR MUHAMMAD, ZHAOYANG FAN, KYOUNG HOON KIM, JINGYU LIN, HONGXING JIANG, Kansas State University — We report on the fabrication of 285 nm AlGaN-based deep ultraviolet light-emitting diodes (UV LEDs) on sapphire substrates with integrated microlens array. Microlenses with a diameter of 12 microns were fabricated on the sapphire substrate by resist thermal reflow and plasma dry etching. LED devices were flip-chip bonded on high thermal conductive AlN ceramic submounts to improve the thermal dissipation, and the emitted UV light was extracted through the sapphire substrates. With the integrated microlense array, a 55% enhancement in the output power at 20 mA DC driving was achieved compared with the same LED without microlens. The light extraction enhancement is the result of the reduced internal reflections of the light caused by the microlense surface profile. An output power of 0.22 mW at 20 mA was measured for a circular LED with a diameter of 275 microns.

Khizar Muhammad
Kansas State University

Date submitted: 05 Jan 2005 Electronic form version 1.4