

Abstract Submitted  
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**Gallium Nitride Light-Emitting Diodes Grown on Silicon Substrates** EDUARDO PARRA, JOSEPH GILGEN, ADAM BLAKE, DEREK CASELLI, CHRIS DUROT, JASON MUELLER, IGNATIUS TSONG, Arizona State University, JOHN ROBERTS, EDWIN PINER, KEVIN LINTHICUM, JAMES COOK, JR., Nitronex Corporation, DANIEL KOLESKE, MARY CRAWFORD, Sandia National Laboratories, ARIZONA STATE UNIVERSITY COLLABORATION, NITRONEX CORPORATION COLLABORATION, SANDIA NATIONAL LABORATORIES COLLABORATION — Light-emitting diodes (LED) of InGaN-GaN multiple quantum wells (MQW) are grown on Si(111) substrates. The lattice mismatch between GaN and Si is accommodated by a buffer layer of ZrB<sub>2</sub>(0001) while the thermal expansion mismatch is alleviated by a transition layer consisting of AlN, AlGa<sub>0.5</sub>N, and GaN. The ZrB<sub>2</sub> buffer layer is grown at Arizona State University (ASU) and the transition layer grown at Nitronex Corporation. The MQW-LED is grown on the resulting composite substrate. The fabrication and the testing of the MQW-LED are conducted at Sandia National Laboratories. The results are compared with an identical InGaN-GaN MQW-LED grown on a conventional sapphire substrate. The three-way collaboration among ASU, Nitronex and Sandia is a project of the National Science Foundation Partnership For Innovation (NSF-PFI) program.

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