

Abstract Submitted  
for the NWS05 Meeting of  
The American Physical Society

**Impact of template morphology on the emission properties of InGaN/GaN multiple quantum wells prepared by molecular beam epitaxy** S. HAFFOUZ, H. TANG, IMS/NRC Canada, T. RIEMANN, J. CHRISTEN, Otto-von-Guericke-Universitaet Magdeburg, Germany, J. BARDWELL, J. WEBB, IMS/NRC Canada — We report on the impact of template morphology on the emission properties of InGaN/GaN multiple quantum wells (MQWs) deposited by plasma-assisted molecular beam epitaxy (MBE). High-resolution X-ray diffraction of MQWs reveals that the indium incorporation rate was drastically increased using faceted surface template as compared to smooth template. Scanning cathodoluminescence (CL) spectroscopy on MQWs deposited at similar growth temperature (620°C) reveals the CL peak position of the integral MQW emission is red shifted from 410nm for a smooth template to 560nm for a rough template. In-rich regions of several nanometers size, found to be preferentially forming near the tips of GaN pyramidal grains were observed by CL mapping of the MQWs deposited on a faceted template, whereas a homogeneous distribution of indium atom fraction was obtained using a smooth template. As a result of this study, using a faceted template, MQWs with considerably improved emission efficiency were demonstrated.

S. Haffouz  
IMS/NRC Canada

Date submitted: 28 Mar 2005

Electronic form version 1.4