

Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

TEM analysis of Microstructure of AlN/sapphire grown by MOCVD¹ B. CAI, M. L. NAKARMI, Department of Physics, Brooklyn College of the City University of New York — AlN and Al-rich AlGa_N have emerged as promising deep ultraviolet (UV) materials for the development of deep ultraviolet optoelectronic devices such as light emitting devices and detectors in the spectral range down to 200 nm. High quality AlN/sapphire can be used as templates to grow nitride based ultraviolet and deep ultraviolet photonic devices due to high thermal conductivity and transparency of the light. The performance of the devices depends of the microstructures of the templates. We report on the microstructure analysis of AlN epilayer grown on sapphire. Both plane and cross section views are investigated by high resolution transmission electron microscopy. It has been revealed that the dislocations are greatly reduced by using high temperature buffers. Density of edge dislocations dominates the total density of dislocations. The microanalysis of Al-rich AlGa_N epilayers grown on AlN/sapphire templates will also be presented. Implications of our finding for the applications in deep UV optoelectronic devices will be discussed.

¹supported by PSC-CUNY

Mim Nakarmi
Department of Physics, Brooklyn College of the City University of New York

Date submitted: 20 Nov 2008

Electronic form version 1.4