Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

Plasma assisted molecular beam epitaxy of strain-balanced a-plane InGaN/AlGaN periodic structures RYAN ENCK, NATHANIEL WOODWARD, C.S. GALLINAT, G.D. METCALFE, HONGEN SHEN, MICHAEL WRABACK, US Army Research Laboratory — A-plane nitride semiconductors have a tunable anisotropic absorption edge that can be exploited to create a compact, broad spectrum THz radiation detector which leverages fiber lasers operating at telecommunication wavelengths. Incident THz radiation is detected by observing the anisotropic change in the anisotropic absorption in the semiconductor of a femtosecond probe pulse by monitoring the polarization rotation of the probe. The sensitivity of this detection method requires a high quality a-plane wurtzite semiconductor with sufficient thickness to provide a large enough polarization rotation as required by the detection scheme. We report on the growth and characterization of strain balanced InGaN/AlGaN periodic structures on various substrates and buffer layers to obtain thick epilayers while maintaining a large absorption anisotropy. We use x-ray diffraction to determine the strain, composition, degree of relaxation, and thickness of our samples and polarization dependent transmission spectroscopy to measure the anisotropic absorption and polarization rotation in these materials

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Date submitted: 09 Nov 2012 Electronic form version 1.4