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Microbeam High Resolution X-ray Diffraction and Reciprocal Space Mapping Characterization of Selective Area Grown InGaN/GaN Waveguides A.A. SIRENKO, New Jersey Institute of Technology, A. KAZIMIROV, S. CORNABY, D. H. BILDERBACK, Cornell High Energy Synchrotron Source, CU, A. OUGAZZADEN, Georgia Institute of Technology, GTL/Metz, France, B. NEUBERT, F. SCHOLZ , Universitaet Ulm, Germany — We present microbeam high-resolution x-ray diffraction (HRXRD) and Reciprocal Space Mapping (RSM) analysis of InGaN/GaN-based MQW ridge-waveguide arrays for monolithically integrated optoelectronic devices. InGaN/GaN waveguides were produced by the MOVPE technique in the Selective Area Growth (SAG) regime with the width of 6 microns and the oxide mask widths varied between 2 and 14 microns. Synchrotron Radiation-based triple- axis HRXRD measurements with the angular resolution of 13 arcsec were carried out at CHESS with the x-ray beamsize of 10 microns. Strain, thickness, and Indium composition variation in the active region of the ridge waveguides have been measured for different configurations of the SAG mask. Gas-phase diffusion coefficients have been determined for In and Ga precursors. Strain-induced relaxation effects in the active regions have been studied using RSM analysis.

Alex Kazimirov
CHESS, Cornell University

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