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Studies on single-phase, indium-rich In1-xGaxN epilayers grown by high-pressure CVD MAX BUEGLER, MUSTAFA ALEVLI, RAMAZAN ATALAY, GOKSEL DURKAYA, JIELEI WANG, INDIKA SENEVIRATHNA, SAMPATH GAMAGE, NIKOLAUS DIETZ, Dept. of Physics and Astronomy, Georgia State University, Atlanta, GA, RONNY KIRSTE, JAN-HINDRIK SCHULZE, AXEL HOFFMANN, Institut fuer Festkoerperphysik, Technische Universitaet Berlin, Berlin, Germany, RAMON COLLAZO, ZLATKO SITAR, Department of Materials Science, North Carolina State University, Raleigh, NC, MUHAMMAD JAMIL, IAN FERGUSON, ECE Department UNC Charlotte, Charlotte, NC — While significant progress in the growth of high quality group III-nitride epitaxial layers has been made during the last decades, the growth of indium rich InGaN epilayers at processing conditions compatible with wide band gap group III-nitrides is still very challenging, especially under low-pressure MOCVD growth conditions. Utilization of elevated pressures to stabilize the growth surface lead to elevated growth temperatures and opened a window for the growth of single-phase material with indium concentrations well above 30%. We present growth conditions and results on structural quality and optical properties of single-phase indium-rich $In_{1-x}Ga_xN$ epilayers. The layers were studied by X-ray diffraction, Raman spectroscopy, atomic force microscopy, optical absorption and IR reflectance spectroscopy, and photoluminescence spectroscopy.

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