Growth of yellow-green In$_x$Ga$_{1-x}$N/GaN quantum wells by plasma-assisted molecular beam epitaxy$^1$ CHIA-HSUAN HU, IKAI LO, WEN-YUAN PANG, CHENG-HUNG SHIH, YU-CHI HSU, YING-CHIEH WANG, CHEN-CHI YANG, Department of Physics, National Sun Yat-Sen University, Kaohsiung 80424, Taiwan, R. O. C. — In order to achieve yellow-green In$_x$Ga$_{1-x}$N/GaN quantum-wells, we grew the In$_x$Ga$_{1-x}$N/GaN quantum-wells (QWs) with high indium concentrations by the insertion of an InGaN buffer layer between the QW and GaN template using plasma-assisted molecular beam epitaxy. The InGaN buffer layer was grown with a gradient indium content, in which the lattice mismatch between In$_x$Ga$_{1-x}$N/GaN QW and GaN template can be reduced. The optical properties of the samples were analyzed by photoluminescence measurement at room temperature. The wavelength of InGaN/GaN quantum-well is shifted from 495nm to 560nm. The XRD and SEM measurement results show the high quality crystalline and smooth surface. Therefore, the InGaN buffer layer with gradient indium content provides an effective way to reach high indium incorporation for high quality yellow-green In$_x$Ga$_{1-x}$N/GaN quantum-wells.

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Chia-Hsuan Hu
Department of Physics, National Sun Yat-Sen University, Kaohsiung 80424, Taiwan, R. O. C.