

INGAN/GAN MULTIPLE QUANTUM WELL STRUCTURES FOR DETECTORS

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Abstract

InGaN/GaN multiple quantum well structures (QW) were prepared by metal-organic vapor phase epitaxy (MOVPE) and characterized them by fine X-ray diffraction measurements. We demonstrate their suitability for scintillator application including a unique measurement of wavelength-resolved scintillation response under nanosecond pulse soft X-ray source in extended dynamical and time scales. The photo-luminescence and radio-luminescence were measured: we have shown that the ratio of the intensity of QW exciton luminescence to the intensity of the yellow luminescence (YL) band IQW/IYL depends strongly on the type and intensity of excitation. Slower scintillation decay measured at YL band maximum confirmed the presence of several radiative recombination centers responsible for wide YL band, which also partially overlap with the QW peak.

Keywords: A-III/B-nitrides, scintillators, photo- and radio-luminescence, MOVPE

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