Improved performance and responsiveness voltage and current LED-based multiple quantum wells of InGaN/GaN

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Abstract In this thesis, first we review, the performance of LEDs , and their carriers movement , and then, we evaluated the Factors that limits their efficiency, . In addition, we defined the LED structure, of InGaN / GaN quantum well in the ATLAS silvaco software. And simulate its single well, and three well structure. Its important parameters, including optical spectra, quantum efficiency, FWHM, and current-voltage curves were extracted. At the end of the simulation, the effect of parameters, such as energy gap, concentration, temperature, and thickness of layers, were assessed on cell function. With this new idea, it was shown that the performance of LED, in three well structures, significantly, has been upgraded compared to single wells. Keywords: LED, potential barrier, quantum wells, InGaN.

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