

Special Issue

Internal Quantum Efficiency of III-Nitride Light-Emitting Diodes

Message from the Guest Editors

III-nitride light-emitting diodes (LEDs) have been of great importance in recent years. Further expansion of LED applications depend on energy efficiency, fabrication cost, and reliability. A major challenge for III-nitride LEDs is delivering the highest efficiency performance at the current densities and temperatures for the intended applications. The internal quantum efficiency (IQE), defined as the ratio of the number of photons emitted from the active region to the number of electrons injected into the device, is a key performance parameter that represents the carrier dynamics as well as the quality of semiconductor epitaxial layers. In this Special Issue, we intend to focus on technical hurdles relevant to the IQEs of III-nitride LEDs emitting from ultraviolet to visible spectral ranges, covering such topics as the IQE measurement methods, microscopic or macroscopic models describing the optoelectronic performances, characterization techniques, efficiency droop phenomena, structural dependences on epitaxial layers, current crowding, or chip size, and short- or long-term reliability.

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Deadline for manuscript submissions

closed (31 December 2019)



Applied Sciences

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Impact Factor 2.5
CiteScore 5.3



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