Physikalisches Institut
Fakultät für Mathematik und Physik
Albert-Ludwigs-Universität Freiburg

QE

Quantum Efficiency Seminar und Colloquium

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OSRAM Opto Semiconductors
Regensburg

Efficiency limits and quantum effects in InGaN LEDs

Today, we are at the edge of a new era in lighting technology. Gallium nitride (GaN) based light emitting diodes (LEDs) are replacing most conventional light sources. Even though they have undergone a tremendous increase in output power over the past years their internal quantum efficiency (IQE) under operation conditions is still limited by quantum processes such as

- non-radiative recombination at defects
- losses at high current densities that might be attributed to an Auger process
- restricted tunneling transport of carriers through inter-QW barriers
- reabsorption and 'recycling' of emitted light
- Reduced wavefunction overlap due to internal piezoelectric fields
- ...

In this talk I will try to show how these effects limit the quantum efficiency and also how we at Osram and other groups try to analyze and model the quantum effects in InGaN LEDs.

Date: **Tuesday, June 11th, 2013, 16:15**
Location: **Lecture Hall 1, Hermann-Herder-Str. 3, Freiburg**

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