



## Journal Menu

[Abstracting and Indexing](#)  
[Aims and Scope](#)  
[Article Processing Charges](#)  
[Author Guidelines](#)  
[Bibliographic Information](#)  
[Contact Information](#)  
[Editorial Board](#)  
[Editorial Workflow](#)  
[Reviewers Acknowledgment](#)  
[Subscription Information](#)

[Open Special Issues](#)  
[Closed Special Issues](#)  
[Published Special Issues](#)  
[Special Issue Guidelines](#)

[Awards for Excellence  
in Editorship](#)

Advances in OptoElectronics  
Volume 2007 (2007), Article ID 69568, 6 pages  
doi:10.1155/2007/69568

## Research Article

Regions of Different Confinement in Low-Dimensional  $\text{Al}_y\text{In}_x\text{Ga}_{1-x-y}\text{N}$  Quantum Structures

A. Gröning, V. Pérez-Solórzano, M. Jetter, and H. Schweizer

4. Physikalisches Institut, Universität Stuttgart, Pfaffenwaldring 57, Stuttgart 70569, Germany

Received 10 September 2006; Revised 7 January 2007; Accepted 8 January 2007

Recommended by Ralf B. Bergmann

[Abstract](#)

[Full-Text PDF](#)

[Linked References](#)

[How to Cite this Article](#)

## Abstract

The optical properties of metal-organic vapor phase epitaxy grown  $\text{Al}_y\text{In}_x\text{Ga}_{1-x-y}\text{N}$  quantum dot structures have been studied by time-resolved photoluminescence experiments. We investigated the recombination dynamics of the photo-excited carriers in dependence of the growth parameters such as aluminium flow and the duration of the growth interruption after the dot deposition. Our results confirm the presence of localized states, where the degree of localization is strongly dependent on the growth conditions. To describe this behavior, we propose a band structure with coupled potentials for these nanostructures. Finally, we demonstrate state filling to prove the zero-dimensional character of the strongly localized states in our quaternary quantum dots.