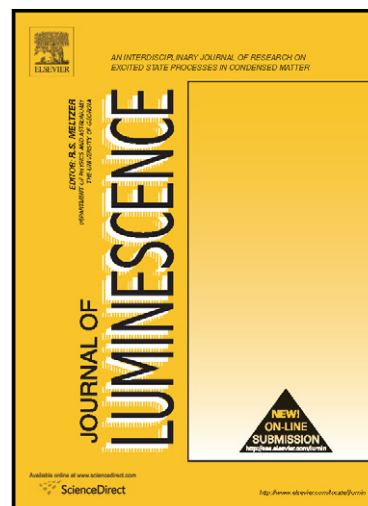


Author's Accepted Manuscript

Carriers' localization and thermal redistribution in post growth voluntarily tuned quantum dashes' size/composition distribution

M.H.Hadj Alouane, A. Helali, D. Morris, H. Maaref, V. Aimez, B. Salem, M. Gendry, B. Ilahi



www.elsevier.com/locate/jlumin

PII: S0022-2313(13)00487-0
DOI: <http://dx.doi.org/10.1016/j.jlumin.2013.08.010>
Reference: LUMIN12089

To appear in: *Journal of Luminescence*

Received date: 4 March 2013
Revised date: 12 July 2013
Accepted date: 2 August 2013

Cite this article as: M.H.Hadj Alouane, A. Helali, D. Morris, H. Maaref, V. Aimez, B. Salem, M. Gendry, B. Ilahi, Carriers' localization and thermal redistribution in post growth voluntarily tuned quantum dashes' size/composition distribution, *Journal of Luminescence*, <http://dx.doi.org/10.1016/j.jlumin.2013.08.010>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting galley proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Carriers' localization and thermal redistribution in post growth voluntarily tuned quantum dashes' size/composition distribution

M. H. Hadj Alouane^{1,3}, A. Helali¹, D. Morris², H. Maaref¹, V. Aimez², B. Salem⁴, M. Gendry³ and B. Ilahi^{1,2}

¹*Université de Monastir, Laboratoire de Micro-Optoélectronique et Nanostructures (LMON), Faculté des Sciences, 5019 Monastir, Tunisia.*

²*Institut Interdisciplinaire d'Innovation Technologique (3IT), Université de Sherbrooke, Sherbrooke (Québec), J1K 2R1 Canada.*

³*Université de Lyon, Institut des Nanotechnologies de Lyon (INL)-UMR5270-CNRS, France*

⁴*Laboratoire des Technologies de la Microélectronique (LTM)-UMR 5129 CNRS-UJF, CEA Grenoble, 17 Rue des Martyrs, F-38054 Grenoble, France*

E-mail: helmi.alouane@yahoo.fr
bouraoui.ilahi@fsm.rnu.tn

Abstract: This paper treats the impact of post growth tuned InAs/InP quantum dashes' (QDas) size/composition distribution on carriers' localization and thermal redistribution. The spread of this distribution depends on the experimental conditions used for the phosphorus ion implantation enhanced intermixing process. Atypical temperature-dependent luminescence properties have been observed and found to be strongly dependent on the amount of QDas size/composition dispersion. The experimental results have been reproduced by a model that takes into account the width of the QDas localized states distribution and consequent thermally induced carriers' redistribution. This model gives critical temperature values marking the beginning and the end of carriers delocalization and thermal transfer processes via an intermixing induced carrier's transfer channel located below the wetting layer states.

Keywords: Quantum Dash intermixing; ion implantation; Temperature-dependent Photoluminescence; localized state ensemble model

Download English Version:

<https://daneshyari.com/en/article/5400223>

Download Persian Version:

<https://daneshyari.com/article/5400223>

[Daneshyari.com](https://daneshyari.com)