

## Journal of Experimental and Theoretical Physics Letters

Publisher: MAIK Nauka/Interperiodica distributed exclusively by Springer

Science+Business Media, Inc.

ISSN: 0021-3640 (Paper) 1090-6487 (Online)


DOI: 10.1134/1.1581967

Issue: Volume 77, Number 7

Date: April 2003

Pages: 389 - 392

Millisecond photoluminescence kinetics in a system of direct-bandgap InAs quantum dots in an AlAs matrix

T. S. Shamirzaev<sup>1</sup> , A. M. Gilinsky<sup>1</sup>, A. K. Bakarov<sup>1</sup>, A. I. Toropov<sup>1</sup>, D. A. Ténné<sup>1</sup>, K. S. Zhuravlev<sup>1</sup>, C. von Borczyskowski<sup>2</sup> and D. R. T. Zahn<sup>2</sup>

(1) Institute of Semiconductor Physics, Siberian Division, Russian Academy of Sciences, Novosibirsk, 630090, Russia

(2) Institut für Physik, TU Chemnitz, D-09107 Chemnitz, Germany

**Received:** 4 March 2003

**Abstract** Anomalously long millisecond kinetics of photoluminescence (PL) is observed at low temperatures (4.2–50 K) in direct-bandgap InAs quantum dots formed in an AlAs matrix. An increase in temperature leads to a decrease in the duration of PL decay down to several nanoseconds at 300 K, whereas the integral PL intensity remains constant up to 210 K. In order to explain the experimental results, a model is proposed that takes into account the singlet-triplet splitting of exciton levels in small quantum dots.

PACS numbers 78.55.Cr - 78.67.Hc

Translated from Pis'ma v Zhurnal Éksperimental'no  $\tilde{\text{I}}$ i Teoreticheskó  $\tilde{\text{I}}$ Fiziki, Vol. 77, No. 7, 2003, pp. 459–463.

Original Russian Text Copyright © 2003 by Shamirzaev, Gilinsky, Bakarov, Toropov, Ténné, Zhuravlev, Borczyskowski, Zahn.

---

 **T. S. Shamirzaev**

**Email:** [timur@thermo.isp.nsc.ru](mailto:timur@thermo.isp.nsc.ru)

*The references of this article are secured to subscribers.*

[Frequently asked questions](#) | [General information on journals and books](#)

---

© Springer. Part of [Springer Science+Business Media](#) | [Privacy, Disclaimer, Terms and Conditions](#), [© Copyright Information](#)