

Download PDF (83 KB)

Applied Physics A

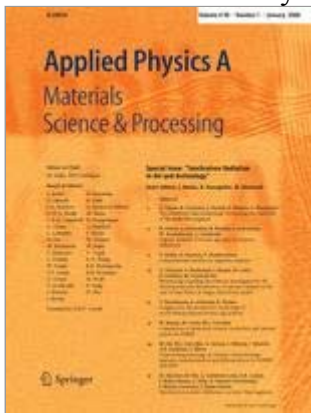
January 2000, Volume 70, Issue 1, pp 29-32

Modeling the optical properties of AlSb, GaSb, and InSb

Abstract.

Optical constants of AlSb, GaSb, and InSb are modeled in the 1–6 eV spectral range. We employ an extension of Adachi's model of the optical constants of semiconductors. The model takes into account transitions at E_0 , $E_0+\Delta_0$, E_1 , and $E_1+\Delta_1$ critical points, as well as higher-lying transitions which are modeled with three damped harmonic oscillators. We do not consider indirect transitions contribution, since it represents a second-order perturbation and its strength should be low. Also, we do not take into account excitonic effects at E_1 , $E_1+\Delta_1$ critical points, since we model the room temperature data. In spite of fewer contributions to the dielectric function compared to previous calculations involving Adachi's model, our calculations show significantly improved agreement with the experimental data. This is due to the two main distinguishing features of calculations presented here: use of adjustable line broadening instead of the conventional Lorentzian one, and employment of a global optimization routine for model parameter determination.

Received: 10 February 1999 / Accepted: 9 June 1999 / Published online: 23 September 1999





About this Article

Title

Modeling the optical properties of AlSb, GaSb, and InSb

Journal

Applied Physics A

Volume 70, Issue 1 , pp 29-32

Cover Date

2000-01-01

DOI

10.1007/s003390050006

Print ISSN

0947-8396

Online ISSN

1432-0630

Publisher

Springer-Verlag

Additional Links

- [Register for Journal Updates](#)
- [Editorial Board](#)
- [About This Journal](#)
- [Manuscript Submission](#)

Keywords

- PACS: 78.20Ci; 78.30Fs

Industry Sectors

- IT & Software
- Electronics
- Oil, Gas & Geosciences
- Engineering
- Aerospace
- Telecommunications
- Chemical Manufacturing
- Automotive
- Materials & Steel
- Consumer Packaged Goods

Authors

- [A.B. Djurišić ^{\(A1\)}](#)

- E.H. Li ^(A2)
- D. Rakić ^(A3)
- M.L. Majewski ^(A3)

Author Affiliations

- A1. Institut für Angewandte Photophysik, TU Dresden, Mommsenstr. 13, D-01069 Dresden, Germany, DE
- A2. Department of Electrical & Electronic Engineering, University of Hong Kong, Pokfulam Road, Hong Kong, HK
- A3. Department of Computer Science and Electrical Engineering, The University of Queensland, Brisbane Qld 4072, Australia, AU

Continue reading...

To view the rest of this content please follow the download PDF link above.

7,614,629 scientific documents at your fingertips
© Springer, Part of Springer Science+Business Media

You have been redirected to our new and improved site.

More info [I'm good, don't tell me again](#)
.springer.com