

Web of Science

Search

Search Results

My Tools

Search History

Marked List 9

[Full Text from Publisher](#)
[Look Up Full Text](#)

[Save to EndNote online](#)
[Add to Marked List](#)

10 of 179

Influence of pseudorandom bit format on the direct modulation performance of semiconductor lasers

By: [Ahmed, M](#) (Ahmed, Moustafa)^[1,2]; [Mahmoud, SWZ](#) (Mahmoud, Safwat W. Z.)^[2]; [Mahmoud, AA](#) (Mahmoud, Alaa A.)^[2]

[View ResearcherID and ORCID](#)

PRAMANA-JOURNAL OF PHYSICS

Volume: 79 Issue: 6 Pages: 1443-1456

DOI: 10.1007/s12043-012-0349-7

Published: DEC 2012

[View Journal Impact](#)

Abstract

This paper investigates the direct gigabit modulation characteristics of semiconductor lasers using the return to zero (RZ) and non-return to zero (NRZ) formats. The modulation characteristics include the frequency chirp, eye diagram, and turn-on jitter (TOJ). The differences in the relative contributions of the intrinsic noise of the laser and the pseudorandom bit-pattern effect to the modulation characteristics are presented. We introduce an approximate estimation to the transient properties that control the digital modulation performance, namely, the modulation bit rate and the minimum (setting) bit rate required to yield a modulated laser signal free from the bit pattern effect. The results showed that the frequency chirp increases with the increase of the modulation current under both RZ and NRZ formats, and decreases remarkably with the increase of the bias current. The chirp is higher under the RZ modulation format than under the NRZ format. When the modulation bit rate is higher than the setting bit rate of the relaxation oscillation, the laser exhibits enhanced TOJ and the eye diagram is partially closed. TOJ decreases with the increase of the bias and/or modulation current for both formats of modulation.

Keywords

Author Keywords: Chirp; digital modulation; eye diagram; jitter; semiconductor laser; simulation

KeyWords Plus: GAIN

Author Information

Reprint Address: Ahmed, M (reprint author)

+ King Abdulaziz Univ, Fac Sci, Dept Phys, MB 20803, Jeddah 21589, Saudi Arabia.

Addresses:

+ [1] King Abdulaziz Univ, Fac Sci, Dept Phys, Jeddah 21589, Saudi Arabia

+ [2] Menia Univ, Fac Sci, Dept Phys, El Minia 61519, Egypt

E-mail Addresses: mostafa.hafez@science.miniauniv.edu.eg

Publisher

INDIAN ACAD SCIENCES, C V RAMAN AVENUE, SADASHIVANAGAR, P B #8005, BANGALORE 560 080, INDIA

Categories / Classification

Research Areas: Physics

Web of Science Categories: Physics, Multidisciplinary

Document Information

Document Type: Article

Language: English

Accession Number: WOS:000312635800007

Citation Network

5 Times Cited
20 Cited References
[View Related Records](#)

[Create Citation Alert](#)

(data from Web of Science Core Collection)

All Times Cited Counts

5 in All Databases
5 in Web of Science Core Collection
0 in BIOSIS Citation Index
0 in Chinese Science Citation Database
0 in Data Citation Index
0 in Russian Science Citation Index
0 in SciELO Citation Index

Usage Count

Last 180 Days: 0
Since 2013: 3
[Learn more](#)

Most Recent Citation

Alshahrie, A. [Multimode modeling of digital modulation in nearly single-mode semiconductor lasers](#). PHYSICS OF WAVE PHENOMENA, APR 2016.

[View All](#)

This record is from:
Web of Science Core Collection
- Science Citation Index Expanded

Suggest a correction

If you would like to improve the quality of the data in this record, please [suggest a correction](#).

ISSN: 0304-4289

Journal Information

Table of Contents: [Current Contents Connect](#)

Impact Factor: [Journal Citation Reports](#)

Other Information

IDS Number: 058LR

Cited References in Web of Science Core Collection: **20**

Times Cited in Web of Science Core Collection: **5**

