SELECTED TOPICS IN ADVANCED ELECTRONICS

Edited by

Khalid A. S. Al-Khateeb

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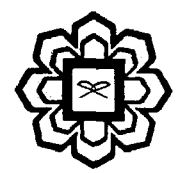

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EMAIL: iiumprinting@yahoo.com

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CONTENTS

CHAPTER 15

ERBIUM DOPED FIBER LASERS WITH DOUBLE TUNABLE BANDPASS FILTER

By

[1]Ali Sallami, [1]Khalid Al-Khateeb, and [2]Bouzid Billoui

[1]Electrical and Computer Engineering Department
Kulliyyah of Engineering
International Islamic University Malaysia
and
[2]Hafr Al-Batin Community College
31991 Saudi Arabia

Synopsis

One of the configurations of Erbium Doped Fiber Laser (EDFL) incorporates Linear Cavity with Fiber Loop-Back (FLB) and a Tunable Band-pass Filter (TBF). This configuration suppresses the Amplified Spontaneous Emission (ASE) and achieves a highly stable output power of more than 18dBm at 1560nm. A standard spectrum is obtained with TBF adjustment.

1 Introduction

Tunable single-frequency lasers in the wavelength region 1550nm are of much interest in a variety of applications such as WDM optical communications, spectroscopy, and fiber sensors [1][2]. These lasers have potential advantages because of their narrow line-width and low intensity noise. They represent a natural source for fiber optical communications, since the light is already in the fiber and they can be spliced directly to the system. Other advantages include high side mode suppression ratio (SMSR), low threshold, and flat output power. These parameters are important in the design considerations for this type of lasers. Various configurations have been proposed aimed at achieving best combination of these characteristics. They include ring cavity [3] and linear cavity [4] structures. The suggested tuning range in the conventional-band (C-band) and long-band (L-band) is