

UNIVERSITI TEKNOLOGI MARA

**STUDY ON THE PERFORMANCE OF C-BAND
ERBIUM DOPED FIBER AMPLIFIER**

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Thesis submitted in fulfillment of the requirements for the degree of

Master of Science

Faculty of Electrical Engineering

July 2015

ABSTRACT

This work analyzed the performance of erbium doped fiber amplifier (EDFA) using different EDF length and pump power. In this study, an EDFA simulation program has been written in Matlab to analyze the active fiber length in around 3m, 15m, 20m, 50m, 80m and 100m to characterize the Gain, ASE power and amplifier output power versus fiber length and input signal power variations of a forward pumping and backward pumping. These EDFA operating in C band (1525-1565 nm) as functions of Er³⁺ fiber length, injected pump power, signal input power and Er³⁺ doping density. The program solves the rate and propagation equations numerically and shows the results graphically. Thus, Gain and ASE performance of an EDFA given with its physical parameters can be graphically obtained and the required physical parameters of an EDFA with desired operating performance can be easily optimized.

Keywords: Optical Amplifiers, EDFA, Erbium Doped Fiber, Gain, ASE

ACKNOWLEDGEMENTS

First and foremost, I would like to thank my main supervisor Dr Mas Izyani Md Ali, who has continuous and generous support and trust on my capabilities. I am sincerely grateful for her advice, invaluable guidance and patience in numerous and long discussions throughout the period of my Msc research. Without her encouragement, feedback, and motivation, this project would not have been completed.

Besides, I am extremely grateful to my colleagues for their supports and brilliant suggestions. Lastly, I would like to offer my personal and special thanks to my family especially my parents and my husband who have encouraged me over the years, believed in me and surrounded me with their love and blessing.

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