

# **POLARIZATION MODE DISPERSION IN OPTICAL FIBER**

This thesis is presented in partial fulfillment for the award of the Bachelor (Hons) of  
Electrical Engineering

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## ACKNOWLEDGEMENT

In the name of Allah SWT, the Beneficent, the Merciful, all praise to Allah for giving the health and strength to proceed the study and enable me to prepare this thesis.

I would like to thank my supervisor, En Mohd Nor Md Tan, for his constant encouragement and belief in me and to who has contributed either directly or indirectly through this thesis and project.

Not forgetting to my family members especially my loving parents, Mohd Nor Bin Mohd Yusof and Che Sharifah bte Hj Shuaib, my friend for their love and encouragement

## ABSTRACT

Polarization mode dispersion (PMD), in single mode optical fibers, is phenomenon that can limit the bit-rate-distance product of amplified, light wave communication systems.

In optical fibers, waveforms broaden over long distances, making these signals difficult to interpret by the time they reach the receiving end. The result is distorted data signals that results in transmission errors at the intended receiver. As network speeds and span lengths increase, dispersion becomes more severe.

This applies to chromatic dispersion (CD) which occurs because different wavelength of light travel at different speeds-its subset, slope mismatch dispersion, and polarization mode dispersion (PMD), which is cause by light traveling faster in one polarization plane than another.

Polarization mode dispersion, in high data rate systems, can significantly diminish the data carrying capacity of telecommunications network. A fundamental property of single mode optical fiber and component, Polarization Mode Dispersion (PMD) is a broadening of the input pulse due to a phase delay between input polarization states.

The main objective of this project is to study and analyze the nature of the Polarization Mode Dispersion problems and the behaviors of the PMD in optical fibers. Next, the experiment and data collection will be doing at the optical fiber.

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