CHAPTER 5

CONCLUSION

5.1   Summary

This chapter describes the contributions of this project and possible future works. In this project a new transmitter medium for spectral slicing WDM system has been developed. Before this laser diode is used as the transmission medium but because of a certain problem or advantages this project is carry out. LEDs have been employed in high-speed local-area applications in which one wants to transmit several wavelengths on the same fiber. A technique called spectral slicing is used.

The study carried out through a theoretical calculation, software simulation and experiments. It is well known that simulations should be able to take care of real environment. Nevertheless, we have set all parameters to be as close as possible to the real situation. For example, the fiber parameters such as the nonlinear effect, noise profile, insertion loss and the photodetector parameters were included in the simulation. The study was carried out using various design parameters namely; distance, bit rate, input power and chip spacing. The effect of these parameters on the system was elaborated through the BER, output power and noise power.

From the result found using the software simulation, the conclusion has been made up. The comparison will be decided whether this development may be successful or not.

The simulation setup for this design use four channel, each channel have their own wavelength which 1551 nm, 1550 nm, 1549 nm and 1548 nm. This wavelength is combined together using mux and demux.

The distance used also may influence the result. For better result used the higher distance. But in a certain case the result is not clear may be because its can not reach the signal or the data sent can not be received properly.

The spectral width of the source is important as it determines the contribution to material dispersion. Low spectral widths allow increased data rate if the material dispersion effects are the limiting factors.

At the transmit side the design contain LED, bias generator, pseudo-random bit sequence generator, NRZ pulse generator, Mach-Zehnder modulator, mux and demux. It's separated from the receiver section by the optical fiber. While at the receiver section it's including photodetector pin, low pass Bessel filter, BER analyzer and demux. Each block has different function. The key requirement is that the output power of the source be strong enough to provide sufficient power to the detector at the receiving end.

5.2   Recommendation for future project

Several key research areas to improve this project are identified as follows:

1. May be for the next research students can be provided with a higher RAM, so that the result can be better because the design parameter such as bit rate may be preserve with a higher value. Therefore students have an advantaged to do further research.

2. Next hopefully the equipment is enough for the students to attain this project. Besides students can have more time to study in personally and details on the project.

5.3   Commercialization Potential

Today technology on communication application had been better day by day. Each day these technologies keep on changing. This is true when communication company such as Maxis, Telekom and Digi busy working out on their new project for their services and products. This is to get more customer or buyer to use their services.

Spectrum slicing provides an attractive low-cost alternative by utilizing spectral slices from a single broadband source as the optical carriers. A key drawback of spectrum sliced systems is the naturally high degree of excess intensity noise, which can impose severe limits on achievable system performance [29]. Performance-optimized spectrum-sliced WDM systems have potential use in both local loop and long-distance fiber communication systems which require low-cost WDM equipment for high data rate applications [30].

After completed this project hopefully this technology can be commercialize. This project can potentially to be commercial for all the communication company so that they can use this technology for their company. So that everyone can get benefit from it.