# ABSTRACT

Rapid development of information technology demands high quality transmission line. Optical fiber is one of transmission lines which can fill that condition. Optical fiber work quality can be increased using *soliton* effect for long distance and high speed transmission technology with minimum dispersion. But this technology still has another lacking, which is timing jitter. Timing jitter is a random shifting of *soliton* pulse and causing the arrival time in the receiver produce error message.

This final project will discuss about timing jitter as the effect of using laser diode as pulse source. Usage of laser diode can cause carrier phase noise, which can shift carrier frequency of *soliton* pulse randomly and could change group velocity as arrival time of optical pulse become random.

Using of optical band pass filter can reduce timing jitter. Transmission length and compatible carrier linewidth for ultra long distance and ultra high speed *soliton* transmission will also be analyzed within this final project.