Fiber Optic Communication Course

Code: EEE426.1

Submitted to

Dr.Sharukh Adnan Khan

Head of Department

Canadian University OF Bangladesh

Department OF EEE

By

Name: Imtiaz Hussain

Batch: Spring 2021

Student ID:21108001

Department of EEE

Canadian University of Bangladesh

Optical Fiber Communication

Transmitter END

On the transmitter side, first if the data is analog, it is sent to a coder or converter circuit which converts the analog signal into digital pulses of 0,1,0,1…(depending on how the data is) and passed through a **light source transmitter circuit**. And if the input is digital then it is directly sent through the light source transmitter circuit which converts the signal in the form of light waves.

Optical Medium

The light waves received from the transmitter circuit to the fiber optic cable is now transmitted from the source location to the destination and received at the receiver block.

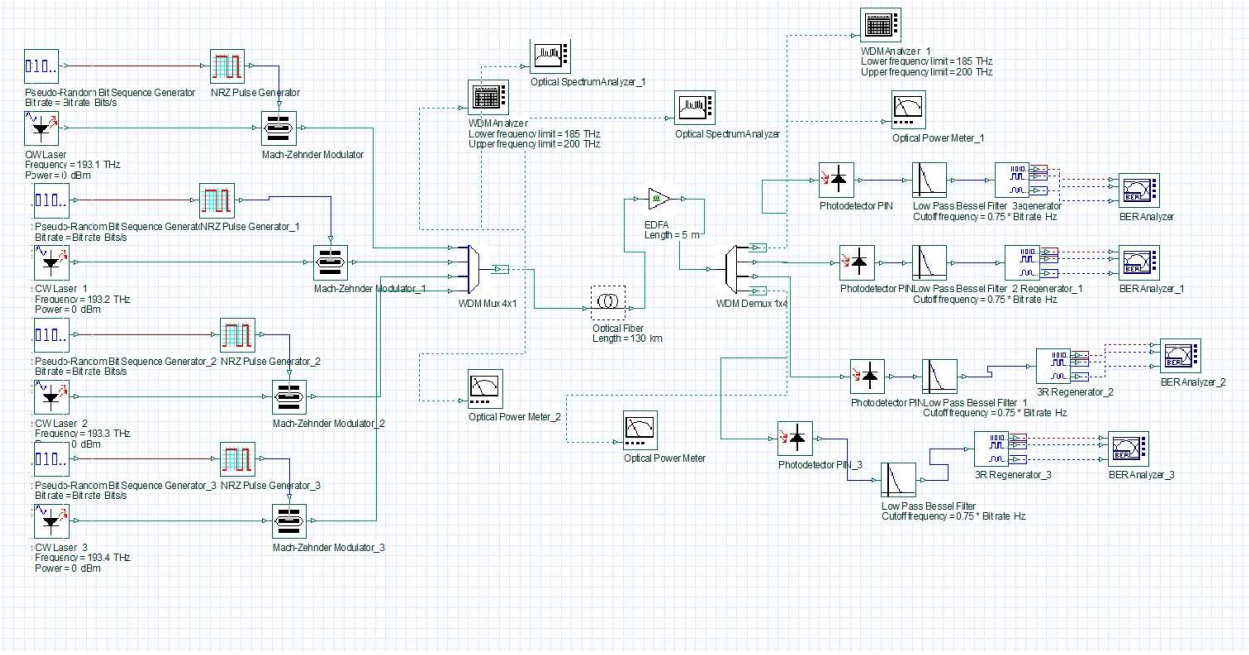
Receiver END

Now on the receiver side the **photocell**, also known as the light detector, receives the light waves from the optical fiber cable, amplifies it using the amplifier and converts it into the proper digital signal. Now the output source is a digital signal so it is not changed further but if the output source needs analog signal, then the digital pulses are then converted back to an analog signal using the decoder circuit.

The whole process of transmitting an electrical signal from one point to the other by converting it into the light and using Fiber optic cable as transmission source is known **as Optical Fiber Communication**.

Component Used

Transmitting END	Optical Medium	Receivers END
○ Pseudo Random Bit ○ Sequence Generator ○ CW Laser Frequency ○ NRZ Pulse Generator ○ Mach Zehnder Modulator ○ WDM MUX	○ Optical Spectrum Analyzer ○ WDM Analyzer ○ Optical Fiber ○ Optical Amplifier(EDFA)	○ WDM Demux ○ Photo Detector ○ Low Pass Bessel Filter ○ 3R Regenerator ○ BER Analyzer

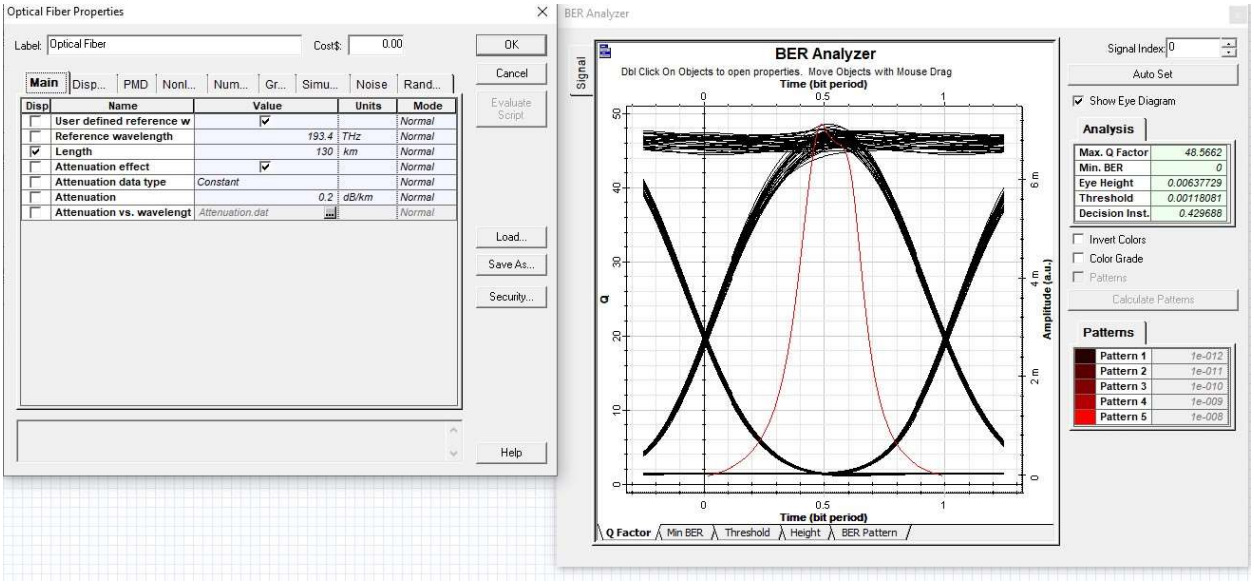


Fiber Optic Communication System

Parameters Changed

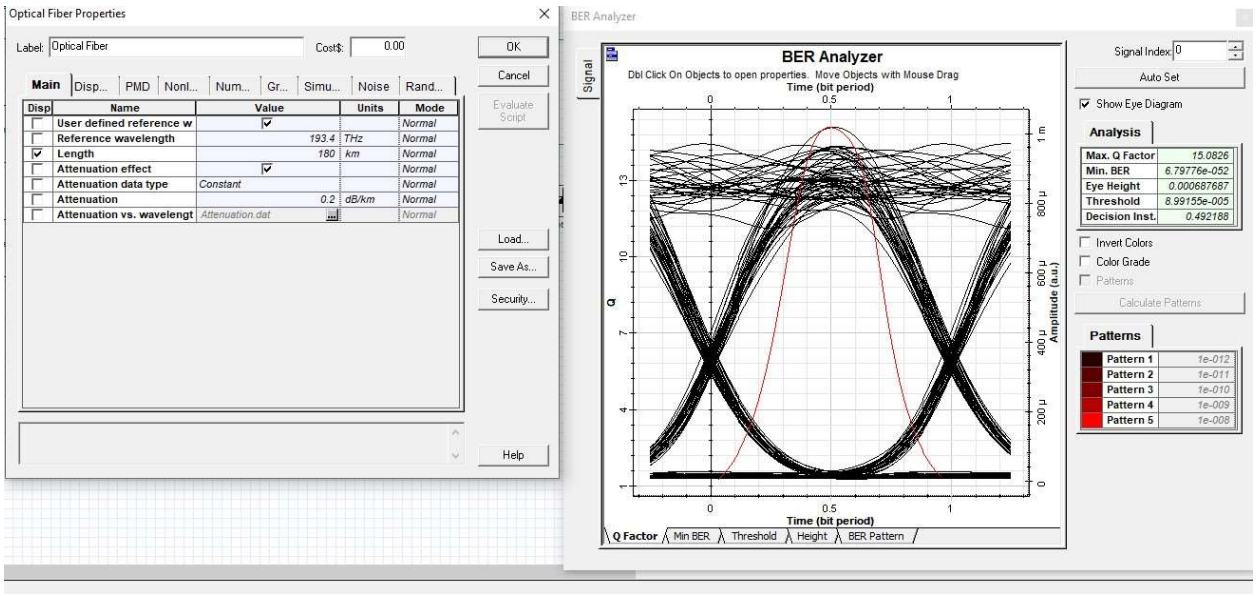
- Marc Zehnder insertion loss doesn't produce any significant changes in the output signal.
- The signal Integrity decrease if we increase the Optical Fiber Distance.

- When Optical Distance is 150 KM – the Q-factor is 23.384 **(Optical Amplifier EDFA).** The noise floor is lower than the signal so the signal is preferred to use.



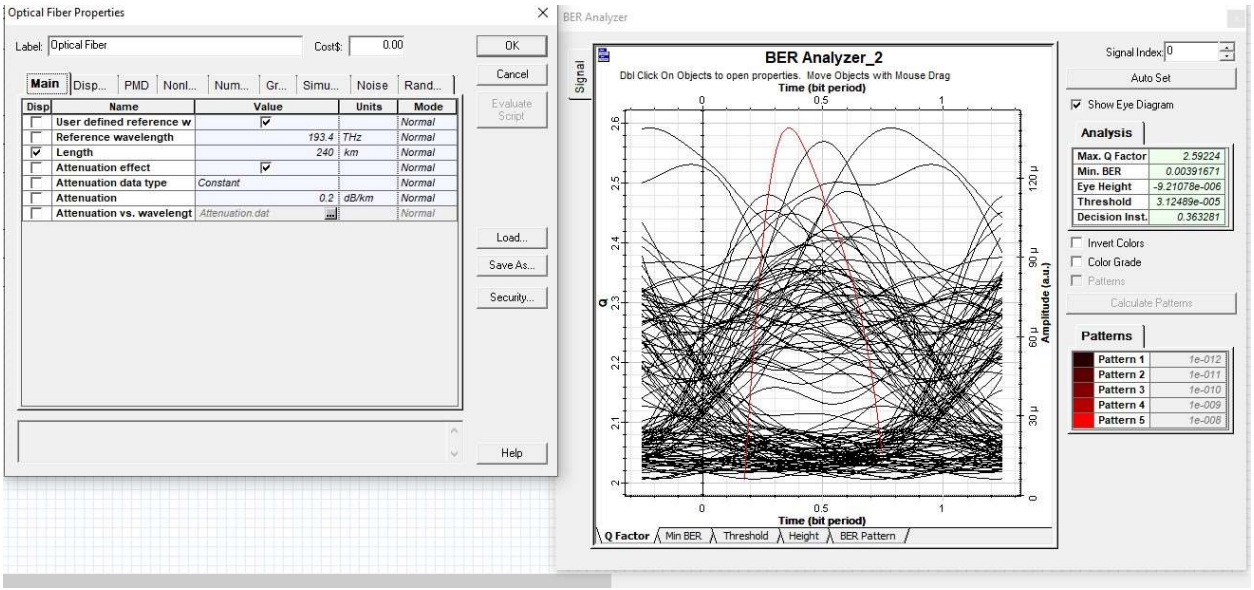
BAR Analyzer Graph

The signal integrity decreases rapidly if we increase the optical fiber length above 155 KM **(Optical Amplifier EDFA)**



BAR Analyzer Graph

The signal is complete lost when the optical fiber distance is above 230 KM



BAR Analyzer Graph