ABSTRACT

Communication systems require a large bandwidth capacity and high quality for data transmission. Dense Wavelength Division Multiplexing (DWDM) technology can be a solution to overcome the limitations of bandwidth and speed of data transmission. DWDM is a technology combining multiple channels in a single optical fiber with a narrow channel spacing. Therefore, it is required an optical filter on DWDM demux to separate the wavelengths that are passed. The type of filter that commonly used is Fiber Bragg Grating.

To obtain the characteristics of Fiber Bragg Grating Filter is used coupled mode theory and transfer matrix method. To get the optimal channel separation, it will be given some input parameters to be observed. Input parameters that will be observed are the FBG distance change (l), the refractive index modulation change (Δn), the phase change between FBG (φ) and number of grating (N).

The input wavelengths in this final assignment are λ_1 = 1552.53 nm, λ_2 = 1553.33 nm and λ_3 = 1554.13 nm. With changes input parameters, we expected the filter system can separate three wavelengths corresponding to the wavelength at the end of the APD receiver. Recommendations and parameters obtained using the optimal filter is N = 18000, Δn = 0.0002, φ = 0 and *l* = l0 mm. With accuracy A Filter is 98.46 %, accuracy for B Filter is 99.11 % and accuracy C Filter is 98.53 % . This simulation using tool Matlab R2009a.

Keywords: Fiber Bragg Grating,Coupled Mode Theory,Transfer Matrix Method