ABSTRACT

Dense Wavelength Division Multiplexing (DWDM) is a technology to combine multiple light wavelengths in an optical fiber. Therefore, in demux DWDM, is required Fi iber Bragg Grating as optical filters for wavelength to pass wavelengths which wanted to transmit and block another wavelength.

Modeling method of the movement micrometer screw is used to alter characteristics of Fiber Bragg Grating. In addition, Coupled Mode Theory and Transfer Matrix method is used to obtain the characteristic spectrums in FBG. The parameters which will be observed are the curvature of FBG and elastic beam (R), FBG refractive index modulation change (Δn), FBG number grating change (N), and wavelength power of filter output ($Pout_{\lambda}$).

In this final assignment, the initial bragg wavelength which used is 1554.94 nm and input wavelengths of filter are λ_1 = 1554.94 nm, λ_2 = 1555.74 nm, λ_3 =1556.54 nm, dan λ_1 = 1557.34 nm. When h = 7 mm, d = 15 mm, L = 90 mm, to change λ_{Bragg} from 1554.94 nm to 1555.74 nm is required 0.09894 nm of Δz, to change λ_{Bragg} from 1554.94 nm to 1556.54 nm is required 0.19788 nm of Δz, and to change λ_{Bragg} from 1554.94 nm to 1557.34 nm is required 0.29682 nm of Δz. In simulation, ouput of filter A is λ_1 with $Pout_{\lambda 1}$ = 0.9756 mW, output of filter B is λ_2 with $Pout_{\lambda 2}$ = 0.9860 mW, output of filter C is λ_3 with $Pout_{\lambda 3}$ = 0963 mW, and output of filter D is λ_4 with $Pout_{\lambda 4}$ = 0.9431 mW.

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