ABSTRACT

Soliton pulses can be used as a generator because it has a narrow spectrum so as to maintain the shape as a result of GVD and SPM weaken each other. Soliton pulse itself can be raised by four pulse generator which, Gaussian Pulse Generator (GPG), Chripped Gaussian Pulse Generator (CGPG), hyperbolic secant Pulse Generator (HSPG), and Super-Gaussian Pulse Generator (SGPG).

Non-linear effect on DWDM caused by Inelastic Scattering and Kerr Effect. Kerr Effect includes Cross Phase Modulation (XPM), Four Wave Mixing (FWM) and Self Phase Modulation (SPM) While Inelastic Scattering is Stimulated Brillouin Scattering (SBS) and Stimulated Raman Scattering (SRS). This study analyzes the Inelastic Scattering where the influence of non-linear refractive index, Raman Coefficient, and the number of pumps greatly affect network performance. The results showed the 32 channels transmitted on the fiber non-linear with $n_2 = 2,6x10^{-18}$ m^2/W using channel spacing of 50 GHz and 100 GHz, Number of pumps as much as 4 and 8, as well as using a bit rate of 2.5 Gbps, 5 Gbps, and 10 Gbps. In this study two scenarios, the first scenario is the ideal condition where the value of the refractive index of the nonlinierities and Raman effects are ignored. The second scenario in the state of all non-linear parameters entered. Fibers used in this study is a type of SMF with material silica dioxide.

The results of the final study was done by comparing the value of the Q-Factors and power between the ideal fiber and fiber non-linear. Value Q-Factors being compared is divided into two parts, that are bit rate and the change in the number of pumps. The result considered feasible if the BER $\leq 10^{-9}$ Q-Factors ≥ 6. The result deserves to be at the bit rate of 2.5 Gbps and 5 Gbps , While the increase in the number of pumps can improve network quality factor created.

Kata kunci: Soliton, Gassian, DWDM, Raman, SBS, SRS