

## **ABSTRACT**

The demands of data transmission services with high data rate and high capacity increase in optical communication system. This condition is more supported with development of WDM (Wavelength Division Multiplexed) that offers increase of transmission capacity in optical communication system. WDM is multiplexing technique that can transmit optical signal with different wavelength into one optical fiber.

In the long distance optical communication system, it is needed several strengthening phase of signal. EDFA (Erbium Doped Fiber Amplifier) is an amplifier that can give direct amplification to optical signal. The characteristics of EDFA have high signal gain with ASE (Amplified Spontaneous Emission) noise addition. To solve the problem, optical filter is needed to decrease noise level. Fiber Bragg grating is one of passive components in optical communication system that acts as optical filter.

The results of simulation show that with using fiber Bragg grating filter, we can reduce ASE noise in EDFA up to 2.5 dB. The result of flattening ASE noise is obtained optimum at loss depth of transmittance at - 2.5 dB with FWHM of 11.6 nm, length of fiber Bragg grating is 78.6 nm, and difference of index of refraction is 0.005.