ABSTRACT

The use of optical device in networking communication system has greatly expanded in the past decade especially optical circuit components. The optical circuit components as integrated system are set up by using many optical circuits consisting of passive devices such as optical fiber coupler, optical switch, filters and for example on-off switch, combiners, and active devices such as laser source, optical spectrum analyzer and other detectors. Dealing with many signal processing, an optical switch becomes important since it is utilized to switch an optical signal not only from one optical waveguide to another but also from many ports and devices to deliver the signal as time independent. In this research, the theoretical study is used to model power propagation based on Coupling Mode Theory (CMT) and Pockel's effect is considered where the breakdown voltage on silica fibers will occur. The model is compared to describe the effect and dominant parameters involved in the optical switch. Concurrently, the optical switch is experimentally designed and operated by using fiber couplers with adjustable coupling ratio. The multi optical switch will be demonstrated by applying the direct current voltage to the coupling region of fabricated fiber coupler. Laser power input is launched where the Fiber Bragg Grating, Circulator, Fiber Coupler, Erbium Doped Fiber Amplifier will be set up to have good performance of optical switch device. As the expected results, the signal will be able to switch from a fiber to other fibers at the coupling region with a desired coupling ratio configuration as ON/OFF mode. Certainly, this design promises a good multi optical switch with adjustable coupling ratio and very useful for signal processing in optical communication system.