

Indra Saifudin, 2010. **Perancangan *Directional Coupler Variable* Menggunakan Dua Jenis Serat Optik *Multimode***. Skripsi ini dibawah bimbingan Supadi, S.Si, M.Si., dan Andi Hamim Zaidan S.Si, M.Si. Program Studi Fisika Departemen Fisika Fakultas Sains dan Teknologi Universitas Airlangga.

ABSTRAK

Fabrikasi *directional coupler variable* menggunakan dua jenis serat optik *multimode step-index*, yakni tipe FD 620-10 berdiameter *core* 740 μm sebagai *transmitter* dan tipe FD 320-05 berdiameter *core* 480 μm sebagai *receiver*. Penelitian ini bertujuan merancang peranti yang menghasilkan berbagai *coupling* dan dapat dijadikan sebagai pemecah berkas (*beam splitter*) dan pembagi daya (*power divider*) dengan cara memberi variasi pergeseran pada *receiver* 10 μm tiap satu kali pergeseran. Perancangan *directional coupler variable* dengan menempatkan 1 serat optik *transmitter* dan 2 serat optik *receiver* dan dikarakterisasi melalui *transmitter*, kemudian diketahui nilai daya yang *tercoupling* melalui daya keluaran pada *receiver* setelah dikonversi dari tegangan terhadap daya. Sebelum melakukan karakterisasi, terlebih dahulu mencari persamaan umum luas *coupling* dan dikonversi ke bentuk daya yang *ter-coupling*, persamaan ini digunakan sebagai pembanding hasil karakterisasi pada fabrikasi. Hasil karakterisasi *directional coupler variable* belum sesuai dengan hasil perhitungan persamaan umum, karena adanya rugi daya (*losses*) yang disebabkan terdapat jarak (*gap*) pada lokasi *coupling* antara *transmitter* dan *receiver* serta ketidaksimetrisan pada proses fabrikasi. *Directional coupler variable* ini dapat digunakan sebagai pembagi daya (*power divider*) dan pemecah berkas (*beam splitter*), tetapi dengan daya maksimum yang tidak sama.

Kata kunci : serat optik, karakterisasi, fabrikasi, *directional coupler variable*, pemecah berkas (*beam splitter*), dan pembagi daya (*power divider*).

Indra Saifudin, 2010. **Variable Directional Coupler Design Using Two Types Of Multimode Optical Fiber.** This thesis under the guidance of Supadi, S.Si, M.Si., and Andi Hamim Zaidan S.Si, M.Si. Physics Studies Program, Department of Physics Faculty of Science and Technology University of Airlangga.

ABSTRACT

A variable directional coupler fabricated using two types of optical fiber step-index multimode, they are the type of FD 620-10 that has diameter of core 740 μm as the transmitter and the type of FD 320-05 diameter of core 480 μm as the receiver. This study aims to design a device that produces a variety of coupling and can be used as a beam splitter and power divider by giving variations a shift in the receiver 10 μm every once shift. The design of the variable directional coupler by placing 1 piece of fiber optic as transmitter and 2 pieces of fiber optic as receiver and it is characterized by transmitter, then be known value of power was coupling through the receiver output power after conversion from voltage to power. Before characterizing, the first find the general equation of the coupling area and it is converted to form the coupling power, this equation is used as a comparison the characterization result of the fabrication. The characterization results of the variable directional coupler has not suitable with the general equation, because of the power loss are caused by the distance on the location of coupling between the transmitter and the receiver and it was caused the asymmetry in the fabrication process. This variable directional coupler can be used as a power divider and the beam splitter, but the maximum power is not the same.

Key words : *fiber optics, characterization, fabrication, variable directional coupler, beam splitter, and power divider.*