Photonic Crystal Fiber and Photonic Crystal Waveguide based 1x4 Power Splitters for Optical Network

Abstract

In this paper 1x4 fixed and flexible power splitters using multicore photonic crystal fiber (PCF) and photonic crystal waveguide array (PCWA) is proposed. Multicore PCF power splitter comprises of four identical cores surrounding the central core (Fixed power splitter). The central core is surrounded by non-identical cores (Flexible power splitter). The optical power launched into the central core is equally divided into four neighboring cores with 25% coupling.
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equal ratio (Fixed power splitter). An unequal distribution of power is observed when the diameters of the cores surrounding the central core are varied. The PCWA power splitter comprises of a rectangular array of dielectric rods in air. This array is integrated with multimode interference coupler (MMI). Fixed and flexible power splitting ratio is obtained by varying the diameter of the rods. The PCWA power splitters are compact (14?m) as compared to the PCF power splitters (57?m). These novel structures are investigated using Finite Difference Time Domain Method (FDTD). Coupled mode analysis is also carried out to understand the super mode patterns and coupling characteristics. The device size reduction compared with the conventional MMI power splitter is attributed to the large dispersion of the PCW and PCF.

References

2013)1262-1266.


Index Terms

Computer Science
Networks/algorithm

Keywords
Power Splitter  Multicore  Pcf  PcW And Fdtd

3 / 3