

English Abstract

In this thesis, we investigate both the coupling and filtering characteristics of a Wavelength Selective Directional Coupler with air grooves. The structure consists of two parallel and identical coupled slab waveguides with periodic air grooves in the space separating them. The spectral response of the structure is investigated by calculating the modal reflectivity and transmissivity. Optical power is launched in one of the four ports of this structure, and the output modal power at the remaining three ports as well as the reflected power at the input port is calculated. The influence of the length, width and the number of periodic air grooves on the coupling and filtering characteristics of the structure are highlighted. The Method of Lines is used in the analysis of this device. The cascading and doubling approach is utilized for this purpose. A three point non-uniform mesh is used in the MOL. In addition, a perfectly matched layer (PML) is incorporated into the MOL to absorb the radiated field.