Abstracts

Coupled-Mode Theory of Two Nonparallel Dielectric Waveguides

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A general theory for treating the coupling between two nonparallel dielectric waveguides is developed using the coupled-mode assumption. This theory is used to analyze directional couplers consisting of two circularly curved, single-mode dielectric slab waveguides. By assuming continuous coupling between the two waveguides rather than only between adjacent segments on the two waveguides, the present theory avoids the awkwardness of having to specify in a somewhat arbitrary manner the separation between these segments, as is the case for existing theories reported in the literature. It is shown that this over-simplification results often in an overestimate of the power transfer in a directional coupler by 10-20 percent, compared to this theory.

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