Abstracts

Analysis and measurement of mode polarizers in square waveguide

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A general analysis approach for strip metallization structures enclosed in rectangular or square waveguide is presented. The technique involves the novel application of a commercially available 2.5-dimensional (2.5-D) method-of-moments-based (MoM) electromagnetic (EM) analysis tool to a three-dimensional (3-D) waveguide problem. Very good agreement is demonstrated between computed and measured results for several printed strip linear polarizers embedded within a square waveguide environment. This paper, to the authors' knowledge, represents the first such comparison of phase and magnitude between computed and measured data for strip grid polarizers in a waveguide environment. The developed approach involves construction of a theoretical waveguide "test fixture" and an associated theoretical de-embedding procedure. Computational advantages are expected over the alternative approach of using a finite-element-based fully 3-D analysis approach. The polarizer results have potential application to shielded versions of quasi-optic array components that have been demonstrated in open geometries, as well as to multimode antenna feeds, waveguide filters, and matching networks.

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