Abstracts

Computer Analysis of Latching Phase Shifters in Rectangular Waveguide (Short Papers)

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Latching phase shifters, consisting of a waveguide section containing a ferrite toroid, are widely used as digital steering elements in microwave array antennas. The theoretical determination of device performance cannot be obtained exactly, since these structures are inhomogeneous along both transverse directions. The present study presents an approximate method to evaluate phase shift and losses in the case of a rectangular toroid. An approximately equivalent structure (twin slab), for which an exact resolution method is available, is considered first. The changes due to the upper and lower sections of the toroid are then evaluated by means of a variational principle. Experimental results show good agreement with computed values for several practical cases considered. Finally, the range of validity for this approximate method is determined.

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