Abstracts

S Matrix of a Broad Wall Coupler Between Dissimilar Rectangular Waveguides

The paper describes a method of moment analysis of a four-port juuction between two dissimilar rectangular waveguides coupled through either a longitudinal slot or a transverse slot on the common broad wall. The Green's function approach has been used to obtain the scattered field inside the primary and the secondary waveguide for both cases. The coupled integro-differential equations, arising from the continuity of the tangential component of the magnetic field at both the interfaces of the slot, are transformed into matrix equation using entire domain sinusoidal basis functions in conjunction with global Galerkin's technique. The results obtained using the present method have been compared with the results available in the literature. The theoretical results on the magnitude and phase of the scattering parameters have been compared with the experimental results for the case of a longitudinal slot coupler with moderate offset from the centerline. The use of global sinusoidal basis functions gives a much faster rate of convergence compared to the use of subsectional basis functions. The equivalent loading of a single slot derived in the paper can be effectively utilized to design a multiaperture coupler.

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