Abstracts

Analysis of Waveguides with Metal Inserts

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A systematic analysis of waveguides with metal inserts is presented. The method is based on a field expansion in terms of the normal modes of the corresponding hollow waveguide without metal inserts. The analysis leads to two main formulations: the matrix formulation and the moment method formulation, The matrix formulation is suitable for structures with smooth metal inserts, which are free from sharp edges, while the moment method is more suitable for metal sheets (e.g. strips and fins) or metal inserts with sharp edges (e.g. ridges). The method is applied to the analysis of ridged waveguides and finlines, and leads to a generalization of the widely used spectral domain technique with respect that ridges, fins, and strips with finite thickness can now equally be analyzed. Any existing routine for the analysis of planar structures, which is based on the spectral domain technique, can slightly be modified in order to take the metallization thickness into account.

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