Abstracts

Wideband Circuit Modelling of Waveguide Discontinuities by FD-TD Methods

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FD-TD methods offer, in principle, promise of great flexibility for application to waveguide discontinuities of any kind. The problem of appropriate termination in the guide enviroment has recently been addressed. Main remaining disadvantages are the volume of computation involved, lack of analytical insight and inability, so far, to produce wideband equivalent circuits, which are prerequisites to effective CAD and synthesis. With a view to remedying these shortcomings, we discuss the extraction from the FD-TD analysis of wideband equivalent circuits. Two significant examples are considered: the inductive post and the 90° H-plane corner, including a modified form of the same. The circuits thus obtained are subsequently employed in the CAD problem of matching over the full waveguide band the modified corner by means of two inductive screws. Theoretical and experimental results are in excellent agreement yielding a reflection <-12 dB over the band and showing the effectiveness of the approach.

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