Abstracts

The Transmission-Line Matrix Method--Theory and Applications

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This paper presents an overview of the transmission-line matrix (TLM) method of analysis, describing its historical background from Huygens's principle to modem computer formulations. The basic algorithm for simulating wave propagation in two- and three-dimensional transmission-live networks is derived. The introduction of boundaries, dielectric and magnetic materials, losses, and anisotropy are discussed in detail. Furthermore, the various sources of error and the limitations of the method are given, and methods for error correction or reduction, as well as improvements of numerical efficiency, are discussed. Finally, some typical applications to microwave problems are presented.

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