Abstracts

On the convergence of the classical symmetrical condensed node-TLM scheme

J.N. Rebel, M. Aidam and P. Russer. "On the convergence of the classical symmetrical condensed node-TLM scheme." 2001 Transactions on Microwave Theory and Techniques 49.5 (May 2001 [T-MTT]): 954-963.

This paper presents a proof of convergence of the transmission-line matrix (TLM) method with a symmetrical condensed node (SCN) in the classical formulation of Johns (1987). It is shown that the convergence order of the SCN-TLM method cannot simply be derived from observing the dispersion characteristics of the TLM mesh. The mapping between the discretized electromagnetic field and TLM wave amplitudes plays a decisive role. Although second-order convergence is observed for coarse discretizations, which are usually used in practice due to the limitations of memory resources, it is shown and numerically verified that the asymptotic convergence reduces to order /spl Oscr/(/spl radic//spl Delta/t). Only using a bijective field mapping defined at the cell boundaries yields second-order convergence.

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