Abstracts

A Field Theoretical Derivation of TLM

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A field theoretical foundation of the TLM method is presented in this paper. In the derivation of the condensed symmetric TLM node, the Method of Moments is applied to Maxwell's equations to obtain dicretized field equations. It is shown that the traditional mapping between wave amplitudes and electric and magnetic field components incorporates serious problems. Therefore, a new mapping between the wave amplitudes and the electric and magnetic field components is introduced. Applying the new mapping to the discretized field equations, the fundamental equations of the three-dimensional TLM method with condensed symmetric node are derived from Maxwell's equations.

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