Abstracts

Alternate Forms of the Generalized Composite Scattering Matrix (Letters)

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The cascading of two scattering matrices to form a composite scattering matrix is a well-known operation. Its advantage over the more straightforward cascading of transmission matrices lies in the fact that scattering matrices avoid the often occurring large transmission matrix elements that lead to computational difficulties. A fairly recent paper by Chu and Itoh used direct substitution between inputs and outputs to derive a form for the generalized composite scattering matrix. We would like to point out that this is by no means the only method of derivation. "Star" matrix multiplication conversion of a generalized composite transmission matrix to its scattering equivalent, and signal flow graph analysis are other methods of derivation. The forms of the resultant composite scattering matrices derived by these methods are often different. It is the purpose of this note to reconcile these different forms.

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