Abstracts

A simple recursive formula for calculating the S-parameters of finite periodic structures

A simple and efficient recursive formula to calculate the S-parameters of large, finite periodic structures is introduced. The technique utilizes measured or computed S matrices of structures with a small number of periods. The formula is verified on a simple rectangular waveguide with periodic gratings. Results from the formula are plotted against similar results obtained from finite-difference time-domain (FDTD) simulations, and they show excellent agreement. This formula can be used to compute the S-parameters of large microwave or optical periodic structures, which, by virtue of their finiteness may not be open to the application of periodic boundary conditions.

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