Abstracts

Scattering from a cylindrical waveguide with rectangular corrugations

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Electromagnetic scattering from a circular cylindrical waveguide with rectangular corrugations is considered in this paper. An analysis method based on dyadic Green's functions and Fourier transforms is used to get the field in terms of modal currents induced on the corrugation openings. The fields are expressed through a series of modal eigenfunctions in the corrugations, and are integrated to get the unknown expansion coefficients. This analysis method can easily be extended to find the dispersion relations of the corrugated waveguide. The series solution obtained is analytic and suitable for numerical computation. Numerical results are presented to illustrate the scattering behavior of a corrugated cylindrical waveguide in terms of frequency and waveguide geometry.

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