Abstracts

Passbands and Stopbands for an Electromagnetic Waveguide with a Periodically Varying Cross Section

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Electromagnetic waves in a rotationally symmetric and perfectly conducting waveguide with a periodically varying cross section are considered. Using the null field (T matrix) approach, a rather complicated determinantal condition for computing the axial wavenumber is derived. For a waveguide where the radius varies sinusoidally with the axial coordinate, the passbands and stopbands for the TE/sub 11/, TM/sub 11/, and TE/sub 12/ modes are numerically computed. When the axial wavenumbers of two modes differ by a multiple of the wavenumber of the wall corrugations, the result is a stopband in the following cases for two TE modes propagating in opposite directions, for a TE and a TM mode in the same direction, and sometimes for two TM modes in opposite directions.

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