Abstracts

A New Method for Calculating TE and TM Cutoff Frequencies of Uniform Waveguides with Lunar or Eccentric Annular Cross Section

Cutoff frequencies are determined for the uniform waveguide with circular outer conductor and eccentric circular inner conductor. The "lunar line" formed by connecting the inner circle to the outer circle is also considered. Both TE and TM modes are treated. The technique used is to combine conformal mapping of the cross section with the powerful method of intermediate problems. This combination of methods has not been applied previously to the calculation of cutoff frequencies. It produces good, rigorous lower bounds for the frequencies. When complementary upper bounds are found by the Ritz method, very small intervals are determined containing the exact frequencies. For the examples considered, the first twenty or so frequencies are bounded very accurately.

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