Abstracts

Wave Scattering in Nonuniform Waveguides with Large Flare Angles and Near Cutoff

A set of coupled first-order differential equations for the wave amplitudes in nonuniform waveguides is developed. The coupling coefficients are regarded as differential transmission and reflection scattering coefficients between two adjacent elementary radial waveguide sections. The analysis is an extension of an earlier quasi-optical solution. This set of coupled equations is compared with the familiar generalized telegraphist's equations which may be derived by considering the nonuniform waveguide to consist of elementary rectangular waveguide sections. The equations for the wave amplitudes derived in this paper are less coupled than the commonly used telegraphist's equations, and they may also be applied to waveguides with large flare angles and in regions at which the waveguide modes are at their respective cutoff cross sections.

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