Abstracts

The Mutual and Input Impedance of Strips Between Parallel Planes

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The input impedance of a thick dipole antenna between parallel planes, or the mutual impedance between two such elements, each carrying an assumed sinusoidal current distribution, is obtained by first considering filamentary dipoles. The longitudinal or tangential field intensity about a single dipole of length L between parallel planes, as indicated in Fig. 1, is therefore obtained by considering the infinite series of images in the two planes, from which the longitudinal field is simply written as an infinite summation of the fields due to the individual dipole elements. This series converges too slowly to be of any practical use, however, and a transformation of series must be applied, which results in the infinite series of exponential terms with imaginary arguments becoming a series of modified Bessel functions of zero order of the second kind. The final expression is given as Eq. (1) below and converges rapidly in most cases.

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