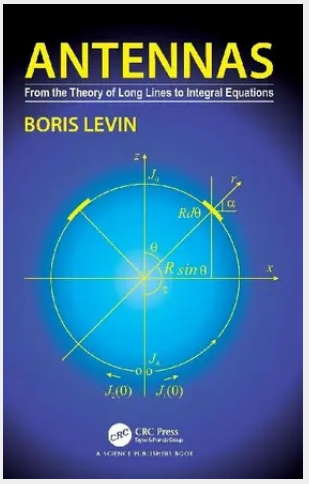
Levin

Antennas

From the Theory of Long Lines to Integral Equations



This book describes both known and new results. In the sections devoted to the use of integral equations for the current in a linear metal radiator, the focus is on Leontovich's equation. An advantage of this equation is the simplicity of the solution and the absence of the argument f in it because the integration over f already performed. The refined solution makes it possible to determine the total sum of the series for the current, which is close to the known solution including only the first terms. The results of the synthesis of different types of antennas with capacitive loads are presented, which makes it possible to implement Hallen's hypothesis about the usefulness of applying such loads to create an in-phase current distribution in antennas and to obtain required characteristics. New results include the widespread use of the complex potential method in relation to the calculation of capacitive structures in homogeneous and inhomogeneous media, antenna patterns and flows of electrical fields between antenna elements and in the surrounding space. In particular, the analysis of field flows makes it possible to substantiate a rigorous method for analyzing microstrip antennas. The characteristics of antennas in various conditions of their installation are considered and compared. The results of the use of multi-floors structures that provide in the wide frequency range the radiation in direction perpendicular to the antenna axis, and structures that make it possible to reduce the mutual influence of antennas located at different heights on a common mast are described.

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