Abstracts

Complementarity in the Study of Transmission Lines

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The principle of complementarity is applied to the slot transmission line. The properties of a dual circuit are investigated. The pairs of several possible duals for a given configuration are correlated and new quantities are defined for use with different types of circuits. A complete parallelism between the two-wire line and the two-slot line is established for the ideal cases and is extended by approximation to include the practical cases. Measurements were made with a two-slot transmission line and its associated probing system. The method of testing the line for balance is discussed. The transverse distribution of the longitudinal current and the attenuation constant were measured. The analogy between the steady-state field in a conducting medium and the electrostatic field in a dielectric is investigated. The expressions for the constants of a two-slot line are given in a form that permits a ready evaluation from experimental data obtained with the electrolytic tank. The measured results are compared with theoretical values.

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