Abstracts

Transmission-Line Conductors of Various Cross Sections

H.A. Wheeler. "Transmission-Line Conductors of Various Cross Sections." 1980 Transactions on Microwave Theory and Techniques 28.2 (Feb. 1980 [T-MTT]): 73-83.

The inner or outer conductor of an RF transmission line may have a noncircular shape of cross section, in which case it can be ascribed an effective radius which is valid if the two conductors are sufficiently separated (as by the ratio of radii). Moreover, there are some combinations of inner and outer conductors whose wave resistance can be evaluated exactly. These can be used to test the approximation of the effective radii. There are some unique shapes of combinations which have binary submultiples of 377 ohms wave resistance because the field pattern of each can be mapped on a set of squares. A variety of cross sections are described and evaluated, with due reference to their sources. They are related by conformal transformations, which are indicated but not derived. One example is an inner conductor whose cross section is a rectangle with rounded edges. One family is based on the crescent or biangle formed of two circular arcs between two angles.

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