Abstracts

Propagation on a Cylindrical Surface Wave Structure Having Radially Nonuniform Dielectric

R.L. Gallawa. "Propagation on a Cylindrical Surface Wave Structure Having Radially Nonuniform Dielectric." 1970 Transactions on Microwave Theory and Techniques 18.8 (Aug. 1970 [T-MTT]): 432-436.

The possibility that a radially nonuniform dielectric might enhance the propagation characteristics of a surface wave line is discussed in terms of the axial cylindrical surface wave on a cylindrical structure. Attention is given to the field structure in the dielectric to determine the effect of the nonuniformity on the dielectric loss. Conclusions are deferred, however, until the change in surface impedance is also examined, since it essentially determines conductor loss and decay coefficient. The surface impedance is examined using the radial transmission line formalism of Marcuvitz. The modified field structure in the nonuniform dielectric and the concomitant change in dielectric loss is found to be most important for the surface wave structure; the nonuniformity changes the surface impedance only slightly since it is already highly reactive.

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