Abstracts

The Scattering of an Axial Cylindrical Surface Wave by a Perfectly Conducting Plane Annulus

The scattering of an axial cylindrical surface wave by a conducting plane annulus coaxial with a Goubau line is investigated both theoretically and experimentally. An integral equation for the current induced on the annulus is developed and solved numerically. A novel approach is used to enforce the edge condition directly in the numerical solution. The computed magnitude of the current induced on a large annulus is plotted and compared with the current which would flow on a short circuit in order to demonstrate the effects of the edges of the annulus. Values of the reflection coefficients are calculated from the computed current distributions. Numerical results are presented and compared with experimental values measured on a Teflon coated aluminum rod. Annluses measuring up to one wavelength in radial width and positioned up to one wavelength above the dielectric are considered, and agreement between theory and experiment is found to be good. A thorough description of the experimental apparatus and measuring technique is presented.

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