

ELECTROMAGNETIC WAVES IN A COAXIAL WAVEGUIDE WITH CIRCUMFERENTIAL CORRUGATIONS

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Coaxial waveguides with circumferential corrugations are used in several high-power microwaves applications [1-2]. In this paper we present the mathematical formulation and the corresponding numerical code (Coaxial Beam Tunnel, CBT) for a coaxial waveguide with non-periodic corrugations filled with a lossy dielectric material. The code calculates the dispersion relation, the electromagnetic field components and the quality factor of the electromagnetic waves, which can propagate. The Floquet theorem is used to express the fields in the vacuum region and an eigenfunction expansion is employed in each dielectric region [3-5]. The boundary conditions imposed at the interfaces lead to a linear system of equations, which is appropriately truncated for the numerical implementation. The code has been developed in C++ and can be used in Windows and LINUX environment. Numerical results are given for several structures and comparison with the well-known numerical code MAFIA [6] is made.

References

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