Analytical method for studying a quasiperiodic disk loaded waveguide

Levi Schächter and John A. Nation
Laboratory of Plasma Studies and School of Electrical Engineering, Cornell University, Ithaca, New York 14853

(Received 3 June 1993; accepted for publication 20 August 1993)

An analytic method to investigate a quasiperiodic disk loaded waveguide is presented. We rely on Cauchy residue theorem to formulate the transmission and reflection from a system composed of radial arms and grooves provided that the inner radius is kept constant; all the other parameters of the system can be arbitrarily changed. This method was successfully utilized to design the input and output section of a high power traveling wave tube which is very sensitive to reflections from both ends. We found this method particularly useful for the design of the output regions where breakdown imposes constraints on the geometry.