

The Coaxial Wire Method: A Comparison Between the Theoretical and Measured Scattering Parameters for Axis-Symmetric Lossy Structures.
M.R. MASULLO, INFN/NAPOLI; V.G. VACCARO, DSF-INFN/NAPOLI; D. DAVINO, G. MIANO, L. VEROLINO, Universita' di Napoli - We propose a method for the evaluation of the scattering matrix parameters of axis-symmetric structures, based on mode matching techniques. The interaction between a particle beam, coming from a pipe, and a resonant cavity is studied in both cases, perfectly conducting and lossy cavity; the coupling between the external pipe and the cavity is also included. The induced field can be expanded according to the normal modes of the structure, rigorously taking into account the ohmic losses in the metallic regions. The method can be applied to a wide frequency range using low order matrices. Scattering matrix has been measured in laboratory for a pill box cavity by means of the coaxial wire method. The comparison with the theoretical data is really satisfactory in the measured range (0-4 GHz) and shows the behaviour of some resonances with geometric cavity parameter.