Abstracts

Perturbation Measurement of Transverse R/Q in Iris-Loaded Waveguides

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The measurement of transverse R/Q in iris-loaded waveguides by perturbation techniques is described. The underlying pertrurbation theory for resonant cavities is reviewed, and formulas for metallic needles, a sapphire rod, and a teflon bead are given, A calibration of the perturbing objects in TM/sub 010/ and TM/sub 110/ cavities shows good agreement with theory. Conventional oscillator and transmission methods are compared, and a systematic error of the oscillator method is explained. A more sensitive null method is described. A definition of the transverse R/Q is given, from which it follows that the knowledge of the longitudinal electric field component is sufficient to determine the deflecting properties of a structure. The accuracy of perturbation measurements was tested on a cavity for which the R/Q was known from computer calculations and deflection tests. It was found that the various values agree to within 20 percent. Perturbation measurements of deflectors with small coupling holes showed the theoretically predicted interaction parameters. Values close to 2.2 k/spl Omega/ /m at 2.856 GHz were measured on a 2/3 /spl pi/ wave structure with about a 2-cm beam hole.

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