

## TEST OF FERRITE CORE FOR RF SYSTEM OF THE TEST RING

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Abstract

The test samples of ferrite cores are prepared for measurements of their characteristics. A suitable sample for the RF system of the TEST RING is already found.

1. Introduction

In the RF cavity of the TEST RING, the ferrite cores are to be used for frequency tuning. The resonant frequency of the cavity is required from 7 to 20 MHz, since the SF cyclotron will be used as an injector. In this case, the multiplication factor for the  $\mu$ -variation of  $>9$  and  $\mu Qf$ -product of  $>10^{10}$  are required as the character of the ferrite core.

For the RF cavity of the NUMATRON, the frequency range of 1.65 ~ 10.49 MHz is required and the corresponding  $\mu$ -variation is  $>41$ .

2. Experimental Setup and Results

The dimensions of the test samples are as follows:

Outer Diameter = 74 mm  
Inner Diameter = 43 mm  
Thickness = 20 mm.

The main characteristics of the sample cores were measured using the test cavity shown in fig.1. The resonant frequency of the cavity,  $f$ , was measured as a function of the magnetic field,  $H$ , and is shown in fig.2. The shunt resistance of the cavity was also measured. From these results, the  $\mu Q$ -value is calculated and is shown in fig.3.

3. Discussion

In general, the ferrite core with a wide frequency range tends to have a low  $\mu Qf$ -product. In our case, however, the value of  $\approx 1 \times 10^{10}$  is obtained for  $\mu Qf$ -product. The sample labeled KC is suitable for the TEST RING.

For the NUMATRON synchrotron, the results are good but are not satisfactory as shown in fig.2. The sample test is still proceeding, and it is sure to obtain a satisfactory one.

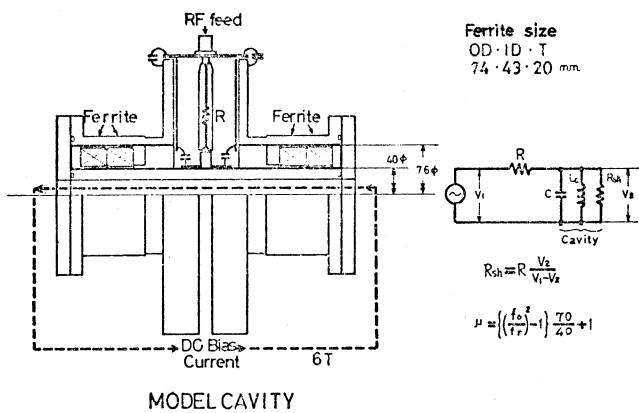


Fig.1. The experimental setup.

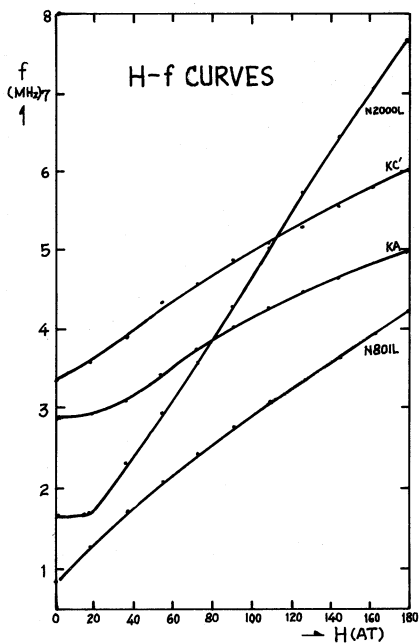


Fig.2. The H-f curves.

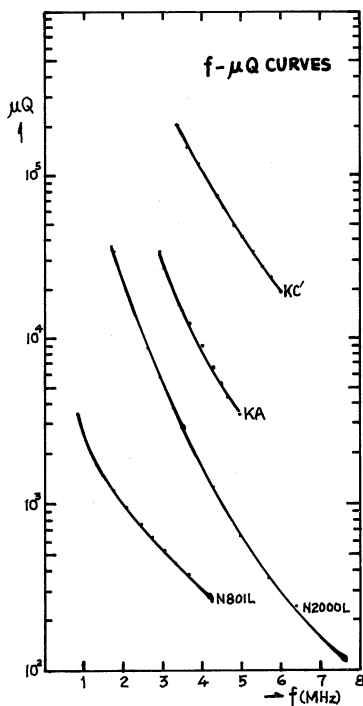


Fig.3. The f-μQ curves.