

Longitudinal Impedance Measurements IX

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OBSERVATIONS AND CONCLUSION

Introduction:

Both runs were made at ≈ 5 GeV again. The first run was plagued by erratic operation of the frequency synchronization loop so that the only useful information obtained was another measurement of Z/n . Before the second run the frequency loop was revamped and tested on the AGS. With stable operation of this loop, another measurement of Z/n was made along with a check on the effect of locking out one of the rf stations. Finally an attempt was made to set up a measurement at ≈ 10 GeV, but time ran out before problems with regulation of the Siemens power supplies could be cured.

Results:

On 1/22/79 we obtained an $f_q - 2f_d = -14 \sim$ at $E = 5$ BeV and $V_{ext} = 249$ kV. The Z/n for Legendre modes was $\approx -63 j\Omega$ and the bunch area .54 eV sec. Excitation was around $h = 13$. On 2/7/79 we found $f_q - 2f_d = -14 \sim$ at $E = 5.12$ BeV and $V_{ext} = 267$ kV. Again excitation was at $h = 13$ and the intensity 4×10^{12} as on 1/22/79. The Z/n for Legendre modes for this run was $-53 j\Omega$ and the bunch area .57 eV sec.

It was also determined that locking out a single cavity does affect f_d since the AGC loop is not perfect. Thus since V_{ext} changes so does f_q in a predictable manner. When the cavity is locked out, care was taken to have it tuned so that no evidence of spontaneous growth of any mode was present. This is probably what confused the results obtained on 12/22/78.