

Horizontal Beam Size Measurement at F20

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POINT OUT TO JOHN H. OUR EXPERIENCE THAT H.E. BEAM SIZE IS STRONGLY DEPENDENT ON MACHINE CONDITIONS.

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Horizontal Beam Size Measurements (data of 4/1/74)

Measurements of horizontal beam size were made by intercepting 5% of the beam with horizontally flipped aluminum targets.

Conditions

- 1) Horizontal targets at F-20 (β_{AV})
- 2) Beam intensity 5.5 to 6×10^{14} p/p
- 3) Average ring vacuum $\sim 3 \times 10^{-7}$ Torr
- 4) These conditions very similar to those existing on 3/9/74 when V size was measured.

was any effect made to vary transmission tuning, phase shift, and radius shifts, to just minimum HE horizontal size?

Results

- 1) Initial measurements shown on accompanying graph.
- 2) ^{H.E.} Horizontal size at F20 ≈ 0.68 " (~ 1.7 cm at $\beta_{AV} \Rightarrow 2.1$ cm at β_{max})
- 3) L.E. horizontal size ≈ 2.2 " (~ 5.5 cm at $\beta_{AV} \Rightarrow 6.8$ cm at β_{max})
- 4) Overall damping ratio $\approx \frac{2.2}{0.68} = 3.2/1$.
- 5) H.E. beam is larger than measurement made previously (see 5/10/73 data, which was made at 4×10^{14} p/p)
- 6) L.E. beam is smaller than measurement made previously (see 5/10/73 data), 2.2 inches compared with 2.9 inches.

Jellerson
3/8/74

This is larger than we see at H10 flog, which is between β_{AV} and β_{max} . We see $\sim \frac{1}{2}$ " with well-behaved AGS.

HORIZONTAL BEAM SIZE (95%)

TIME IN ACCELERATION CYCLE

SPINNING BEAM

HORIZONTAL SIZE (INCHES)

TIME AFTER T_0 (MILLISECONDS)

- 1) HORIZONTAL TARGET AT F_{20} (BAY)
- 2) BEAM INTENSITY: 5.5 TO 6.0×10^{12}
- 3) DATA OF 4/1/74

