

## 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 (pAV)
- 2) Beam intensity 5.5 to  $6 \times 10^{14}$  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) <sup>H.E.</sup> Horizontal size at F20  $\approx 0.68$ " ( $\sim 1.7$  cm at pAV  $\Rightarrow$  2.1 cm at pmax)
- 3) L.E. horizontal size  $\approx 2.2$ " ( $\sim 5.5$  cm at pAV  $\Rightarrow$  6.8 cm at pmax)
- 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  $4 \times 10^{14}$  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  $\beta_{av}$  and  $\beta_{max}$ . 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  $6.0 \times 10^{12}$
- 3) DATA OF 4/1/74

