

Affect of Lower B on Capture Efficiency

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Purpose: To lower the injection \dot{B} value with the hope of increasing the rf capture.

Background: Measurements made on 4/24/73 indicated that with the present \dot{B} of ≈ 2.6 kG/sec and a nominal setting of rf level 2, the equilibrium phase angle near injection is $\approx 21^\circ$. This corresponds to a bucket of $\approx 220^\circ$ width, height of .055 eV-sec and area of .29 eV-sec. The bunch width a few msec after injection was measured to be about 210° . The total net gap voltage, calculated from the \dot{B} and measured f_ϕ , was found to be ≈ 50 keV or about 1.6 kV/gap (8 stations on this date).

Results: The injection \dot{B} was lowered to ≈ 1.45 kG/sec and the rf parameters adjusted for best intensity (this was $3-4 \times 10^{11}$ less than with the higher \dot{B}). The bunch width a few msec after injection was measured and found to be $\approx 210^\circ$. At the lower \dot{B} and with the same gap voltage (50 kV) the bucket width should be $\approx 275^\circ$. A measured bunch width of 204° was obtained at the larger \dot{B} (≈ 2.6 kG/sec). One would have expected a wide bunch and perhaps a higher intensity, but this was not the case. Intermediate values of \dot{B} were also tried, i.e., ≈ 2 and 2.3 kG/sec. and they gave essentially the same intensity as obtained at 2.6 kG/sec. The latter value was retained for operations.