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Test of High Voltage (120 kV peak) Acceleration

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The first part of the period was used in an unsuccessful attempt to improve the spiraling beam present with the operating point of $\nu_x \approx 8.64$, $\nu_y \approx 8.77$. Then acceleration with high initial voltage (≈ 120 Kv) was tried. This gave about 3×10^{12} max. It was noted that by reducing the linac pulse to ≈ 90 μsec from 180 μsec the machine seemed to operate in a more reproducible manner. Also the amount of beam present during the first quarter cycle of phase oscillation was less but the overall intensity remained the same. Next quasi adiabatic capture was attempted and after considerable tuning of the RF parameters plus some low field corrections a few pulses at 5×10^{12} were obtained and operation over 4.5 was fairly steady. If the linac pulse was lengthened the intensity dropped by $\approx 10\%$ and large bunch shape oscillations lasting for up to 5 msec appeared. The radial loop was closed down but this did not remove the effect. Also switching to the F-15 x FM RAs a source of the bootstrap RF did not help. Then the effect started to disappear on most pulses and the intensity drop was only $\approx 5\%$. Returned to the high voltage capture mode and obtained at best 3×10^{12} again. Then the low voltage mode was tried again but at best could only obtain 4×10^{12}. The injected intensity after multiturn was as was $\sim 9\text{-}10\times10^{13}$. By measuring the Band phase oscillation frequency it was possible to calculate the capture voltage for the quasi-adiabatic mode. A value of 61.6 Kv was obtained very nearly the pre-shutdown value of ≈ 50 Kv!