



Brookhaven
National Laboratory

BNL-103948-2014-TECH

AGS.SN70;BNL-103948-2014-IR

Test of High Voltage (120 kV peak) Acceleration

E. Raka

September 1974

Collider Accelerator Department
Brookhaven National Laboratory

U.S. Department of Energy

USDOE Office of Science (SC)

Notice: This technical note has been authored by employees of Brookhaven Science Associates, LLC under Contract No.AT(30-1)-16 with the U.S. Department of Energy. The publisher by accepting the technical note for publication acknowledges that the United States Government retains a non-exclusive, paid-up, irrevocable, world-wide license to publish or reproduce the published form of this technical note, or allow others to do so, for United States Government purposes.

DISCLAIMER

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, nor any of their contractors, subcontractors, or their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or any third party's use or the results of such use of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof or its contractors or subcontractors. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

Paku, E. Gill

AGS Studies 9/15/74

0100-0600

The first part of the period was used in an unsuccessful attempt to improve the spiraling beam present with the operating point of $v_x \approx 8.64$, $v_y \approx 8.77$. Then acceleration with high initial voltage (≈ 120 kV) was tried. This gave about 3×10^{12} max. It was noted that by reducing the linear pulse to ≈ 90 psec from 130 psec 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 linear 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 slowed down but this did not remove the effect. Also switching to the F-15X FMR as 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 multistep was only $\approx 9-10 \times 10^{13}$. By measuring the Band phase oscillation frequency it was possible to calculate the capture voltage for the quasi-adiabatic mode. A value of 6.6 kV ^{was obtained} very near to the pre-shutdown values of ≈ 50 kV!