

# BNL-104019-2014-TECH AGS.SN141;BNL-104019-2014-IR

# Search for Intensity Limits on AGS Spiraling Beam

J. W. Glenn

April 1983

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.DE-AC02-76CH00016 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.

Number 141

#### AGS STUDIES REPORT

Date <u>April 20</u>	0, 1983 Time 0500
Experimenters _	J.W. Glenn, E. Gill, L. Ahrens
Reported by Subject	L. Ahrens
	Search for Intensity Limits on AGS Spiraling Beam

#### OBSERVATIONS AND CONCLUSION

The purpose of this study was to inject increasing quantities of  $H^-$  beam into the AGS up to limitations of the linac while observing the resulting circulating beam intensity as a function of time. In particular, we were searching for intensity-dependent (space charge) loss patterns.

The number of protons obtained from HEBT was increased from 1 x  $10^{13}$  to 4 x  $10^{13}$  by increasing the linac pulse width from 120 to 420 microseconds. Photos were taken of the resulting L20 current transformer pulses, and a record kept of the scalar reading of AGS circulating beam current. Figure 1 gives AGS intensity vs HEBT intensity. Figure 2 is a tracing of photos of the L20 wave forms for the various currents.

From the figures: 1) the fraction of injected current which initially survived, remained constant within errors over this range of intensity, 2) higher intensity resulted in earlier spiraling beam loss until the intensity was reduced to low levels.

This was a one-hour study, which precluded significant parameter vartiation due to time limitations. The rf system was  $off--B^+$  off, cavities mistuned to supress self-bunching of the beam. Essentially, the full pulse width available from the source was used (420 microseconds). The reported linac current was 18-19 mA.

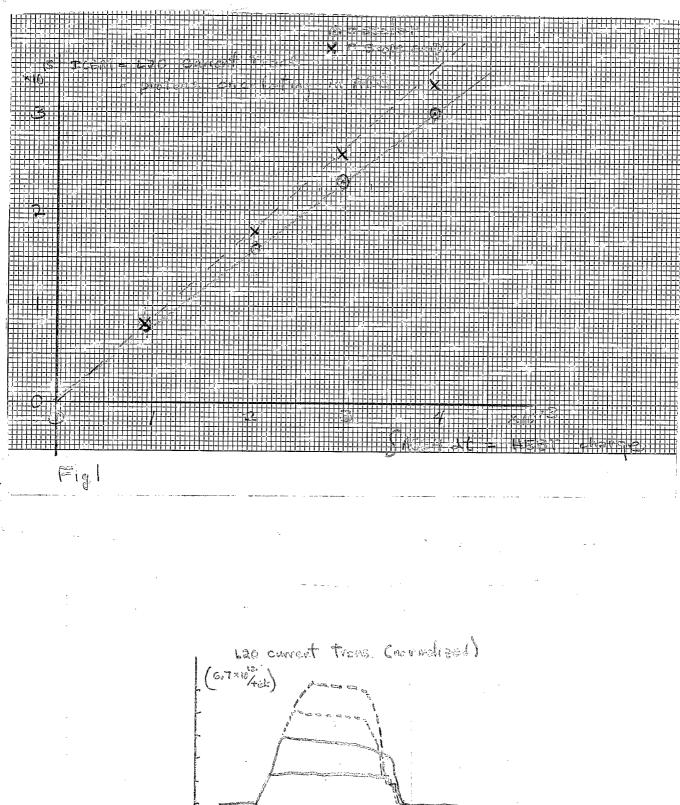


Fig 2

200 MS/ 410 KS



## AGS Studies Report #141