



Brookhaven  
National Laboratory

BNL-103959-2014-TECH  
AGS.SN81;BNL-103959-2014-IR

## SEB-FEB sharing

E. Gill

December 1976

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.E(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.

MCR

AGS STUDIES REPORT

NUMBER 81

12/1/76-12/2/76 2000-0300 Gill, Glenn,  
Date 12/6/76 Time 0900-1600 Experimenters Keane, Lee, Soukas, Wanderer

Subject SEB - FEB Sharing

OBSERVATIONS AND CONCLUSION

Results

A slow beam of  $\sim 4 \times 10^{11}$  was extracted on 12/2/76 over a spill of  $\approx 200$  ms. The remaining  $6 \times 10^{12}$  was extracted to the North Area in a normal fashion. The background in the North Area was excessive. The AGS ran at 2.0 sec Rep. Rate. The high background in the North Area caused the termination of this mode of operation.

The SEB spill was run "open loop" and had severe structure at  $\sim 60$  cycle as well as the expected rf structure. The effective spill was  $\approx 20$  ms with the rf structure reducing the number further.

This setup was again attempted on 12/6/76. The program for the AGS rf system was modified and a small amount of acceleration added after the SEB flat top. The beam was extracted to the North Area on the added rise. Initial results indicate the background to be satisfactory. Slow beam was not extracted due to ejector power supply problems. Beam was spilled at the slow beam time. Other "sharing" ratios have not been tested.

The equipment settings are recorded in the SEB Parameter Book for the above duties.

Conclusion

Though the two areas were not delivered satisfactory beam at the same time, the two partial successes should be additive. It is reasonable to plan to run  $\sim 10\%$  of the beam to the SEB users and the remainder to the North Area. The slow spill would have rf structure of  $\approx 20$  ns bunches every 224 ns as well as a "macro" structure of about 60 cycle which alone would reduce the effective spill time by a factor of  $\sim 10$ . Closing the spill loop would not improve the structure significantly. The incremental power to extract "200 ms" spill would be  $\sim 1/3$  or normal SEB operation. Any beam transport and user power would be as normal for SEB operation. The "200 ms" spill would also change the North Area Rep. rate from 1.3 sec to 1.8 sec.

Though expensive in power for the amount of potential physics, this mode of operation could allow a smoother transition from FEB to SEB operation. Further testing is necessary before this mode is scheduled.