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SEB-FEB sharing

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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 ≈ 200 ms. The remaining 6×10^{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 ~ 60 cycle as well as the expected rf structure. The effective spill was ≈ 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 $\lesssim 20$ 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 ~ 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.