



BNL-103953-2014-TECH

AGS.SN75;BNL-103953-2014-IR

Affect of Upstream FEB Magnets on AGS Beam Intensity

R. R. Adams

November 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.

Date: Nov.23, 1976 Time 1200-1330 Experimenters Adams, Blumberg, Gill

Subject Affect of upstream FEB magnets on AGS beam intensity.

OBSERVATIONS AND CONCLUSION

Magnets UP1, UQ1, UQ2 and UD1→ 3 were varied. The affect on the AGS beam was noted by readout of 10 pulses of the early CBM scaler ($t_{read}=100$ ms) with early rf turnoff ($t_{off} = 200$ ms). The average circulating beam per pulse is tabulated below for various combinations of magnet on-off conditions. Magnet excitations are in DATACON readback units. The pulse-to-pulse fluctuations in the CBM was measured as $\pm 1.3\%$ rms.

<u>UP1</u>	<u>UQ1</u>	<u>UQ2</u>	<u>UD1→ 3</u>	<u>CBM (/10¹²)</u>
1595	2668	3341	3010	9.53
1104	2668	3341	3010	9.56
1587	OFF	3339	3010	9.08
1588	2675	OFF	3010	6.78
1579	OFF	OFF	3010	2.74
OFF	OFF	OFF	3015	5.82
OFF	OFF	3340	OFF	9.09
OFF	2675	OFF	OFF	8.78
1584	OFF	OFF	OFF	5.59
OFF	OFF	OFF	OFF	6.84

We conclude from the above data that the FEB magnets have a large affect on beam intensity. Their affect is presumably corrected for by the existing low field correction magnets. UQ1 and UQ2 together decreased the beam by more than a factor of 3. The intensity appears to be more sensitive to UQ2 than to UQ1. Magnets UP1 and UD1→3 appear to compensate somewhat the affect of Q1 and Q2. Horizontal and vertical orbits were taken with UQ1 and UQ2 off and show an orbit oscillation of $\sim \pm 1$ mm amplitude. With the magnets on, no orbit deformation is seen. We noted that magnets UQ1 and UQ2 are near (~ 2 ft.) straight section H15 which at present is unoccupied. We recommend that magnetic shielding be installed in this straight section. The magnitude of the stray field was not measured.