

Losses at F10

D. A. Barge

May 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.

AGS STUDIES REPORTDate May 29, 30, 1983Time 1400, 1100 (respectively)Experimenters D.A. Barge and J.W. GlennReported by D.A. BargeSubject Losses at F10OBSERVATIONS AND CONCLUSION

We have examined losses at F10 vs position and skew of the ejector magnet, using the integral loss monitor F10DL. The loss monitor was sampled at 2100 ms after t_0 , well after the end of flattop (end of flattop was at 2000 ms after t_0). Machine intensity was fairly steady at 10×10^{12} protons/pulse (std. CBM) during the time losses were recorded. Each data point represents an average over 20 pulses.

The attached figures show dependencies of three integral loss monitors: the total ring loss (RLMS), F5 upstream loss monitor (F5ULM), and the downstream loss monitor F10DL. Figure 1 shows losses vs F10 position, holding the skew fixed; that is, $F10DS - F10US = 100$ H (read-backs, 1 millinch = 1 H). Figure 2 was generated moving the upstream end of F10 only. As is seen from Figure 2, the downstream position does change due to the fact that the motor drive units and position sensors are at different longitudinal locations.

Both figures indicate a region of minimum loss of about 0.35" or a total clearance of 0.92" (downstream septum width = 0.571"). In passing, it might be worthwhile to point out, however, that there are three loss modes: 1) inner side (toward center or ring) of septum striking circulating beam, 2) outer side of septum striking extracted beam, 3) inner side of magnet backleg striking extracted beam.

Figure 2 indicates that the best operating point is with the upstream position 95 mils smaller than the downstream position, according to the behavior of F10DL only.

F10 LOSS VS. F10 POSITION
 29-MAY-83 14:27 26.4
 TEST VAR #NONE AVG= 20

YA:F10DL,0= 0.000,100= 500.000
 YB:RLMS,0= 0.000,100= 4000.000
 YC:F5ULM,0= 0.000,100= 250.000
 YD:F10US,0= 1400.000,100= 1600.000

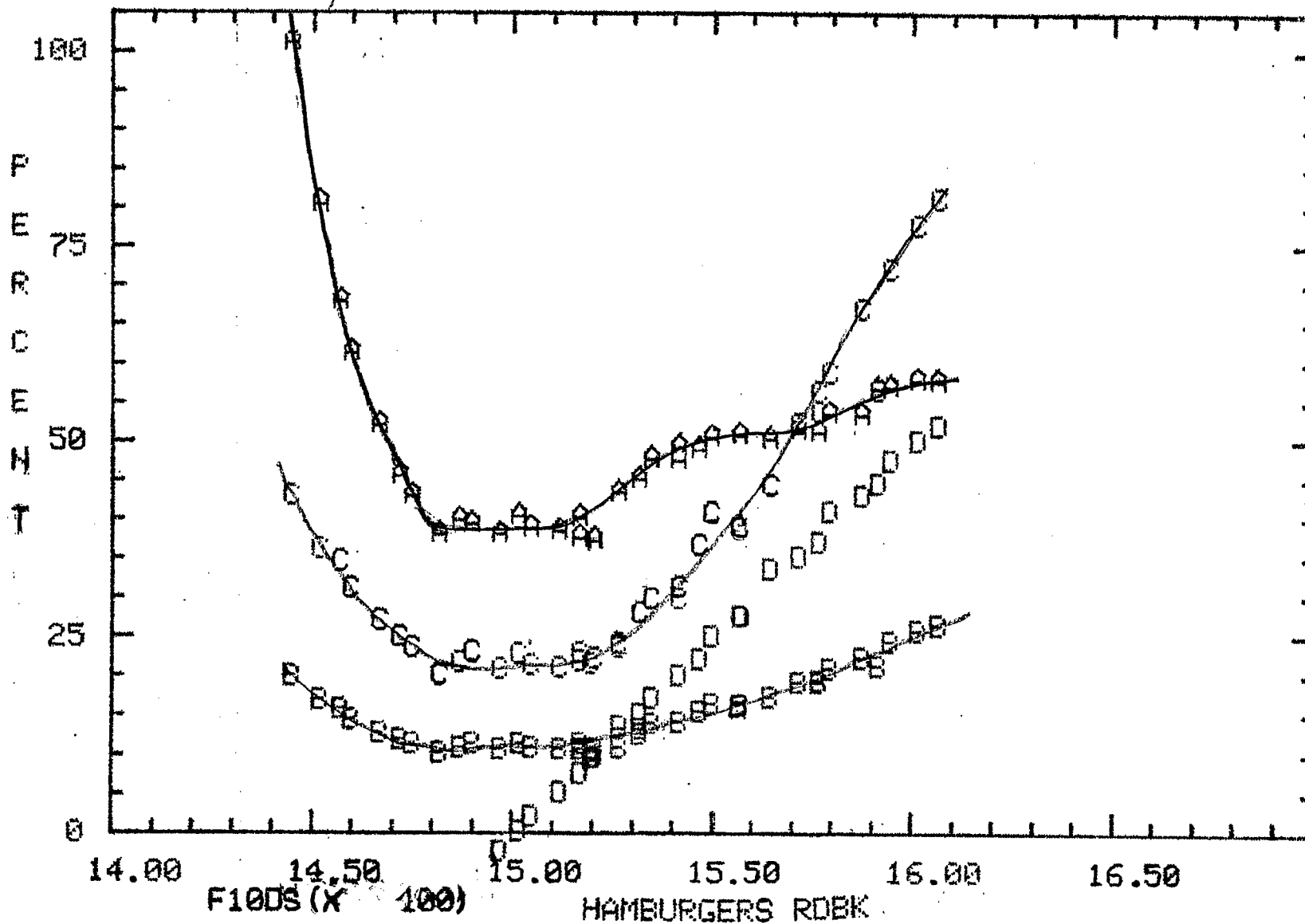


FIGURE 1

F10 LOSS US. F10 POSITION
 30-MAY-83 10:40 50.1
 TEST VAR #NONE AVG= 20

YA:F10CL.0= 0.000,100= 500.000
 YB:RLMS .0= 0.000,100= 4000.000
 YC:F5ULM.0= 0.000,100= 250.000
 YD:F10DS.0= 1400.000,100= 1600.000

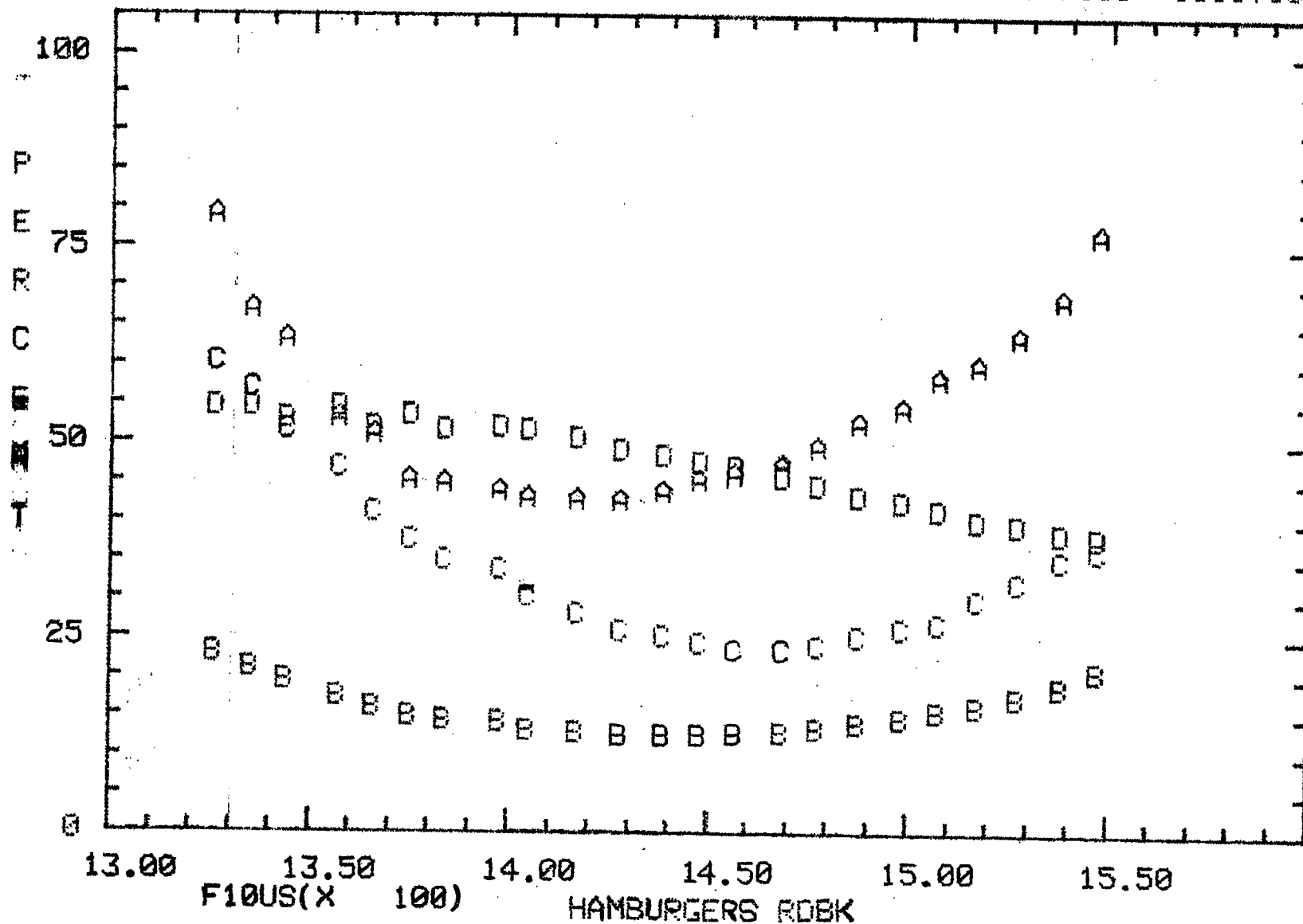


FIGURE 2