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Losses at F10

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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 F1ODL. 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 F1ODL. Figure 1 shows losses vs F10 position, holding the skew fixed; that is, F1ODS-F1OUS = 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 F1ODL 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

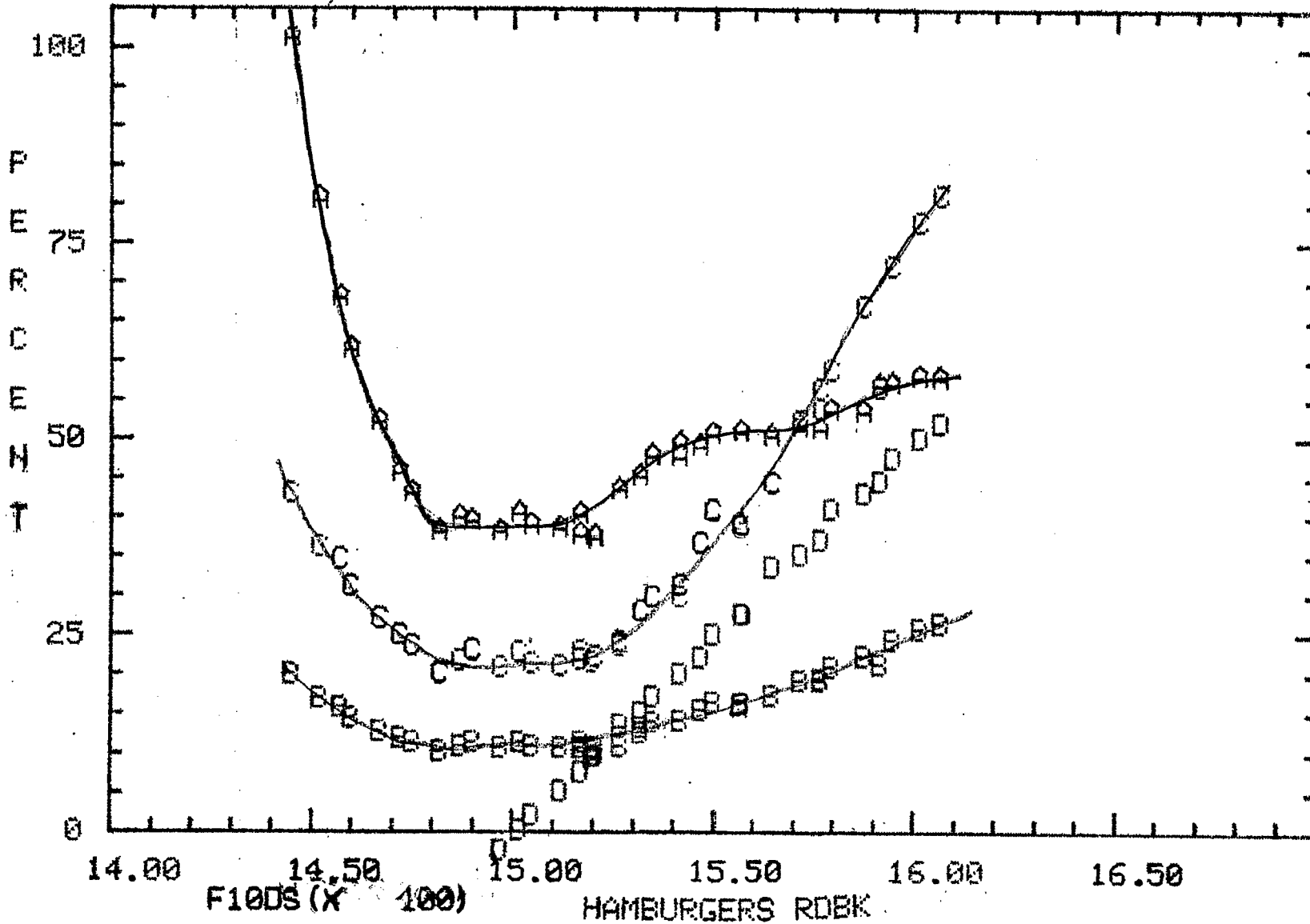


FIGURE 1

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

YA:F10DL.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

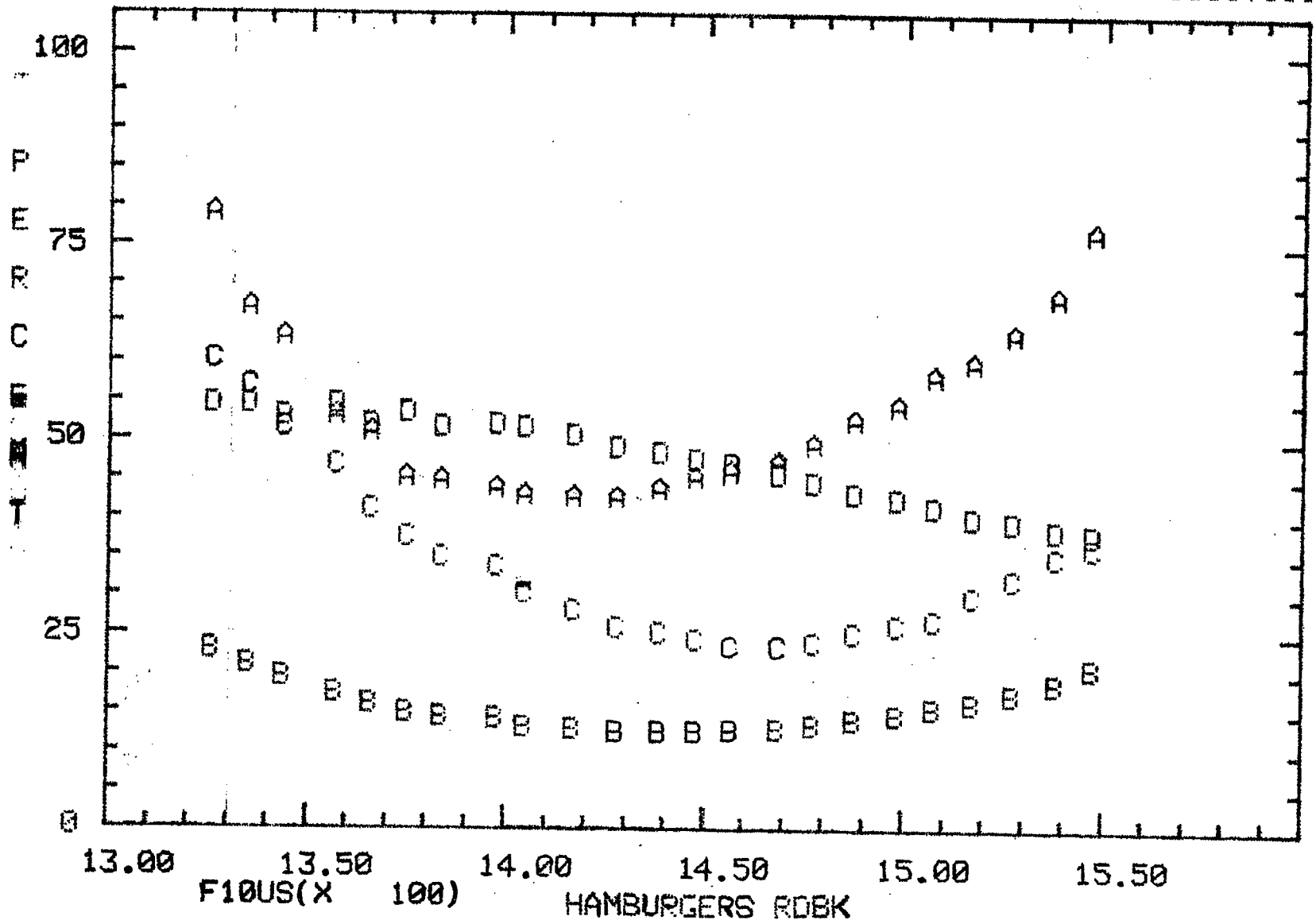


FIGURE 2