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Losses at F10

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DISCLAIMER

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Reported by D.A. Barge

Subject Losses at F10

OBSERVATIONS 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_o, well after the end of flattop (end of flattop was at 2000 ms after t_o). Machine intensity was fairly steady at 10 x 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 (readbacks, 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.

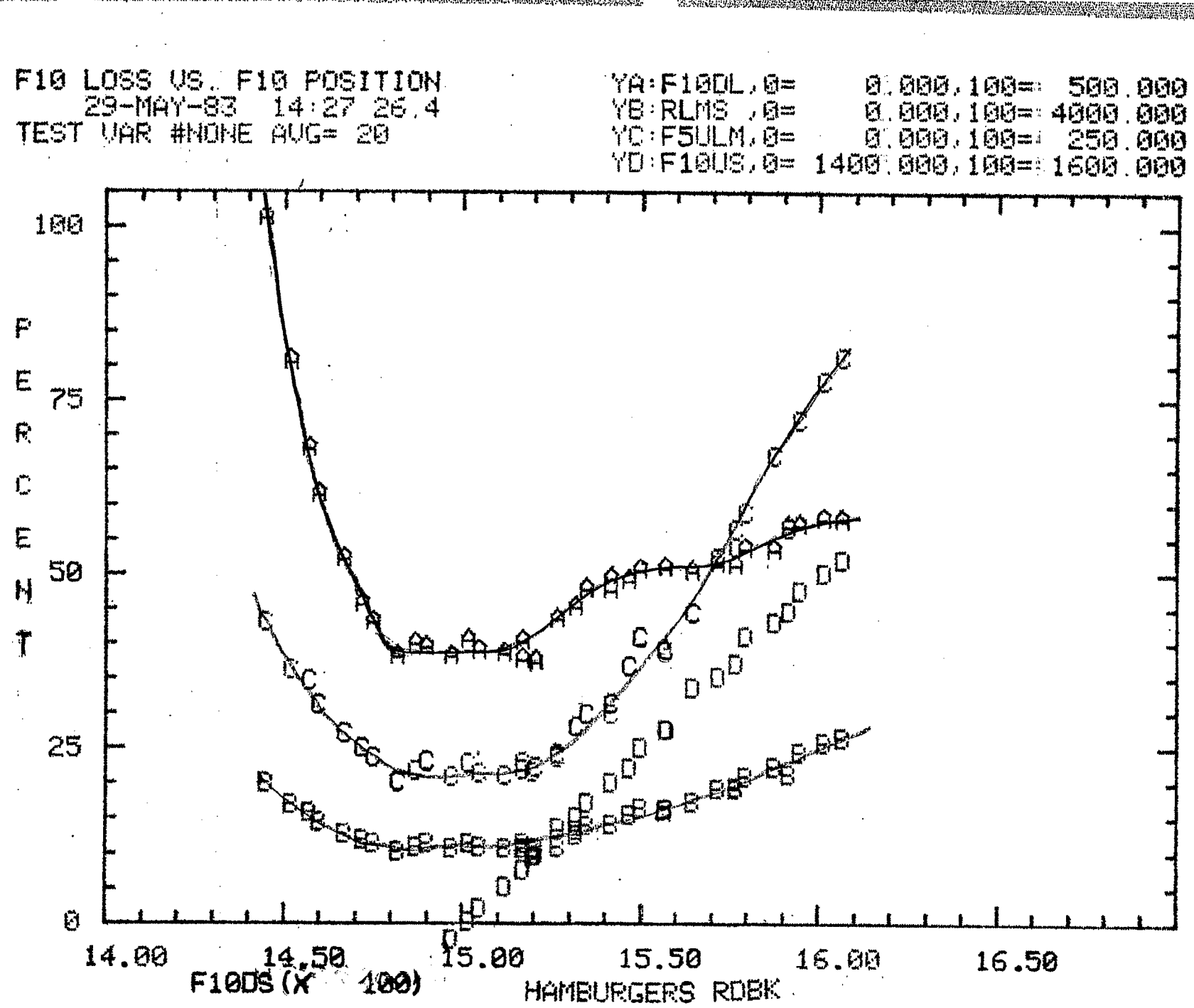
F10 LOSS VS. F10 POSITION
29-MAY-83 14:27 26.4
TEST VAR #NONE AVG= 20
YA:F10DL,0= 0.000,100= 500.000
YB:RLMS ,0= 0.000,100= 4000.000
YC:F5ULM,0= 0.000,100= 250.000
YD:F10US,0= 1400.000,100= 1600.000
PERCENT
100
75
50
25
0
14.00
14.50
15.00
15.50
16.00
16.50
F10DS(X 100)
HAMBURGERS RDBK

FIGURE 1

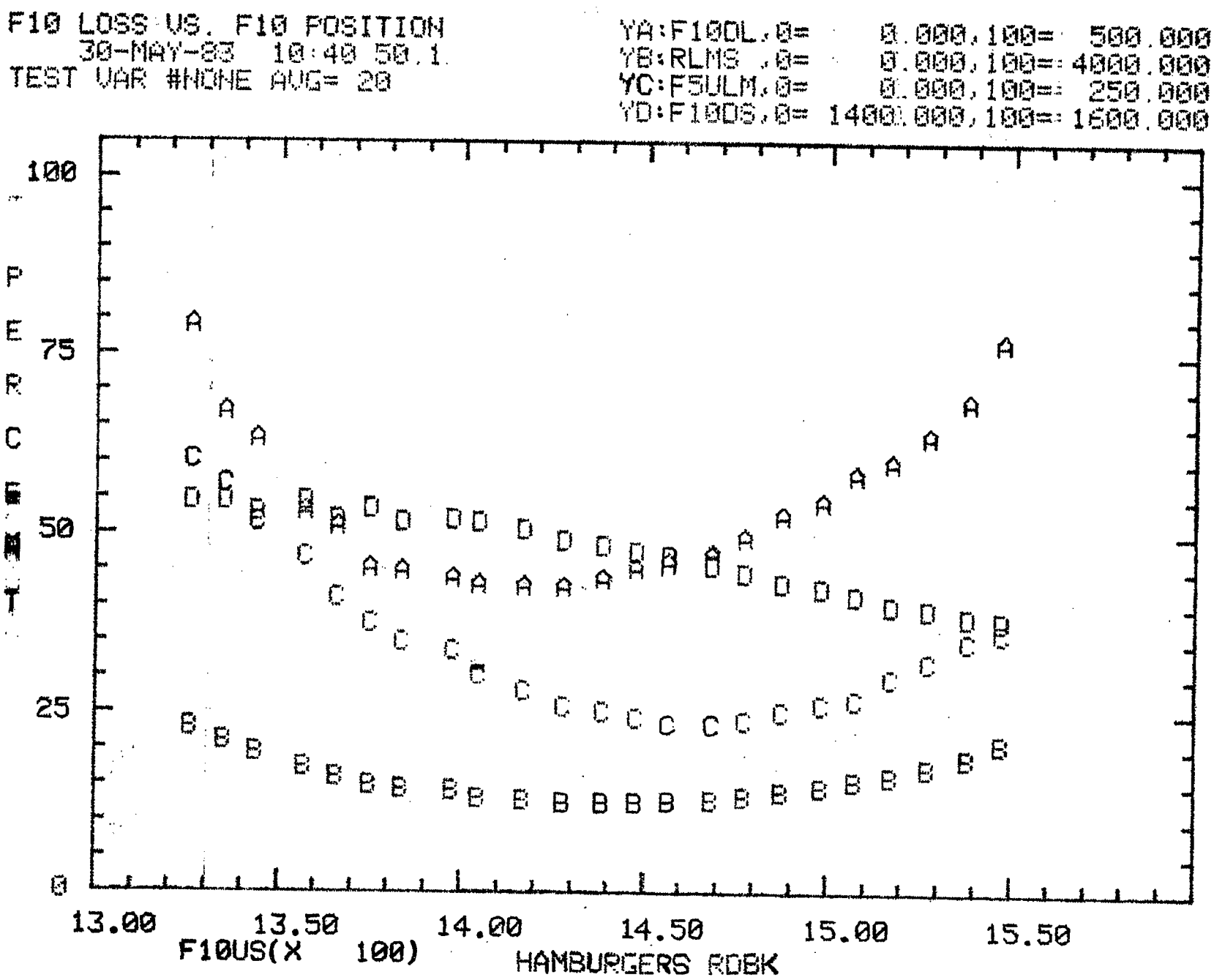
F10 LOSS VS. F10 POSITION
30-MAY-83 10:40 50.1
TEST VAR #NONE AVG= 20
YA:F10DL,0= 0.000,100= 500.000
YB:RLMS ,0= 0.000,100=:4000.000
YC:F5ULM,0= 0.000,100=: 250.000
YD:F10DS,0= 1400.000,100=:1500.000
PERCENT
100
75
50
25
0
13.00
13.50
14.00
14.50
15.00
15.50
F10US(X 100)
HAMBURGERS RDBK

FIGURE 2