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Message ID: **4832** Entry time: **Tue Jul 20 19:15:55 2010**

Run:	915
Author:	TP
Type:	Info
System:	General
Subject:	Beam spot imaging, transport settings

Beam spot imaging with muons

Settings: Mirror Angle=295, Mirror vertical=17.5 mm, TD Angle=85, TD=29 mm

- For several transport settings, the L1/2/3 and RA values were not set according to energy scaling. I used the 15kV settings, and changed the settings according to
 - moderator-HV scaling for L1/L2
 - energy-after-TD scaling for L3/RA.
 This gives now similar beamspot for all transport settings (the old 20kV settings caused some distortions in the beam spot).
- Compared to the May-2010 settings, the RA-TB steering had to be increased for "normal" transport settings: instead of RAT-RAB = 120 V, the difference is now 160 V at 15 kV transport
- Checked and updated "normal" transport settings for 20, 18,15 ,14 ,13.5 ,12 ,11 ,10 ,7.5 kV.
- The 15kV "small sample" settings: the RA steering has been adjusted to center the beamspot on MCP2.
- Modified settings are in the SVN repository
 Updated lem00, pc5331, pc5332, pc7962, laptops pc5793 and pc7776 in area.

15kV "normal" and "small sample" settings:

LE-uSR event rate for small sample settings is 0.88*"normal rate".

See Figs. 4+5 for "small sample" beamspots "07/2010" and "before 07/2010".

Beam spot data for ZF						
Transport settings	RA-LRTB	meanX (mm)	meanY (mm)	in 10x10mm ² (TOF cut)	in 20x20mm ² (TOF cut)	
"normal"	10.59-10.53-10.64-10.48	-0.04	+0.14	50.2% (53.9%)	88.0% (91.3%)	
"small sample, 07/2010"	11.03-10.97-11.08-10.92	-0.11	-0.13	59.8% (63.7%)	86.0% (89.0%)	
"small sample, before 07/2010"	11.00-11.00-11.00-11.00	-0.66	+1.57	56.5% (60.0%)	---	

For High-Field settings (15kV, L3=9.75kV, RA ~ 0) I used following RA steering settings to better center the beam spot:

Run	Field	RA-L	RA-R	RA-T	RA-B	alphaLR	alphaTB
975	100	0.0	0.0	0.5	0.0	0.987	0.963
993	500	0.0	0.0	0.5	0.0	0.993	0.973
994	750	0.0	0.0	0.3	0.0	1.005	0.971
995	1000	0.0	0.0	0.0	0.0	1.018	0.961
996	1250	0.0	0.0	0.0	0.7	1.048	0.946
997	1500	0.5	0.0	0.0	0.8	1.040	0.979
998	1750	0.7	0.0	0.0	0.6	0.994	0.976
999	2000	0.9	0.0	0.0	0.7	0.997	0.949
1000	2250	0.9	0.0	0.0	0.6	1.008	0.929
1001	2500	0.7	0.0	0.0	0.5	1.027	0.914

Run 996(1250G) should have been 0.25-0-0-0.4!

See also Figs. 1-3.

20 kV Settings:fug_20-0kv_2-6ug_nosample.xml

TofMCP2-FMin=1400, TofMCP2-FMax=1900

Moderator	20.0
Mod_Guard	16.0
Mod_Grid	12.50
Lense_1	11.33
Mirror	20.0
Lense_2	17.33
Lense_3	11.41
RA-L	14.48
RA-R	14.38
RA-T	14.54
RA-B	14.32

For the above settings, the beam properties are (all from hPos00, MCP2 y%x fine):

Run #	Field (A)	Mean x	Mean y	RMS x	RMS y
970	0	-0.07	0.13	5.6	5.4

18 kV Settings:fug_18-0kv_2-6ug_nosample.xml

TofMCP2-FMin=1450, TofMCP2-FMax=1900

Moderator	18.0
Mod_Guard	14.4
Mod_Grid	12.48
Lense_1	10.2
Mirror	18.0
Lense_2	15.6
Lense_3	10.19
RA-L	12.92
RA-R	12.84
RA-T	12.98
RA-B	12.78

For the above settings, the beam properties are (all from hPos00, MCP2 y%x fine):

Run #	Field (A)	Mean x	Mean y	RMS x	RMS y
960	0	-0.07	0.14	5.6	5.3

15 kV Settings:fug_15-0kv_2-6ug_nosample.xml

TofMCP2-FMin=1600, TofMCP2-FMax=2000

Moderator	15.0
Mod_Guard	12.0
Mod_Grid	10.4
Lense_1	8.5
Mirror	15.0
Lense_2	13.0
Lense_3	8.35
RA-L	10.59
RA-R	10.53
RA-T	10.64
RA-B	10.48

For the above settings, the beam properties are (all from hPos00, MCP2 y%x fine):

Run #	Field (A)	Mean x	Mean y	RMS x	RMS y
913	0	-0.04	0.14	5.7	5.5
914	17.5	0.29	-0.48	5.8	5.6
915	-17.5	0.42	0.50	5.8	5.6

Without TOF (with TOF) cut:

50.2% in 10x10 mm² (53.9%)

88.0% in 20x20 mm² (91.3%)

For small sample settings with RA-LRTB = 11.03-10.97-11.08-10.92

Without TOF (with TOF) cut:

59.8% in 10x10 mm² (63.7%)

86.0% in 20x20 mm² (89.0%)

Rate for small sample settings is 0.88*"normal rate".

14 kV Settings:fug_14-0kv_2-6ug_nosample.xml

TofMCP2-FMin=1650, TofMCP2-FMax=2050

Moderator	14.0
Mod_Guard	11.2
Mod_Grid	9.7
Lense_1	7.93
Mirror	14.0
Lense_2	12.13
Lense_3	7.74
RA-L	9.82
RA-R	9.76
RA-T	9.87
RA-B	9.71

For the above settings, the beam properties are (all from hPos00, MCP2 y%x fine):

Run #	Field (A)	Mean x	Mean y	RMS x	RMS y
919	0	-0.05	0.02	5.7	5.5
920	17.5	0.26	-0.61	5.7	5.6
921	-17.5	0.46	0.39	5.8	5.6

13.5 kV Settings:fug_13-5kv_2-6ug_nosample.xml

TofMCP2-FMin=1650, TofMCP2-FMax=2100

Moderator	13.5
Mod_Guard	10.8
Mod_Grid	9.36
Lense_1	7.65
Mirror	13.5
Lense_2	11.7
Lense_3	7.43
RA-L	9.42
RA-R	9.36
RA-T	9.47
RA-B	9.31

For the above settings, the beam properties are (all from hPos00, MCP2 y%x fine):

Run #	Field (A)	Mean x	Mean y	RMS x	RMS y
953	0	-0.12	-0.06	5.8	5.5

12.0 kV Settings:fug_12-0kv_2-6ug_nosample.xml

TofMCP2-FMin=1750, TofMCP2-FMax=2300

Moderator	12.0
Mod_Guard	9.6
Mod_Grid	8.32
Lense_1	6.8
Mirror	12.0
Lense_2	10.2
Lense_3	6.51
RA-L	8.27
RA-R	8.21
RA-T	8.31
RA-B	8.17

For the above settings, the beam properties are (all from hPos00, MCP2 y%x fine):

Run #	Field (A)	Mean x	Mean y	RMS x	RMS y
952	0	-0.18	-0.06	5.9	5.7

11.0 kV Settings:fug_11-0kv_2-6ug_nosample.xml

TofMCP2-FMin=1800, TofMCP2-FMax=2400

Moderator	11.0
Mod_Guard	8.8
Mod_Grid	7.62
Lense_1	6.23
Mirror	11.0
Lense_2	9.53
Lense_3	5.9
RA-L	7.49
RA-R	7.43
RA-T	7.52
RA-B	7.40

For the above settings, the beam properties are (all from hPos00, MCP2 y%x fine):

Run #	Field (A)	Mean x	Mean y	RMS x	RMS y
954	0	-0.04	0.01	5.9	5.7

10.0 kV Settings:fug_10-0kv_2-6ug_nosample.xml

TofMCP2-FMin=1850, TofMCP2-FMax=2450

Moderator	10.0
Mod_Guard	8.0
Mod_Grid	6.93
Lense_1	5.67
Mirror	10.0
Lense_2	8.5
Lense_3	5.29
RA-L	6.72
RA-R	6.66
RA-T	6.74
RA-B	6.64

For the above settings, the beam properties are (all from hPos00, MCP2 y%x fine):

Run #	Field (A)	Mean x	Mean y	RMS x	RMS y
955	0	-0.07	0.11	6.0	5.9

7.5 kV Settings:fug_07-5kv_2-6ug_nosample.xml

TofMCP2-FMin=2150, TofMCP2-FMax=2800

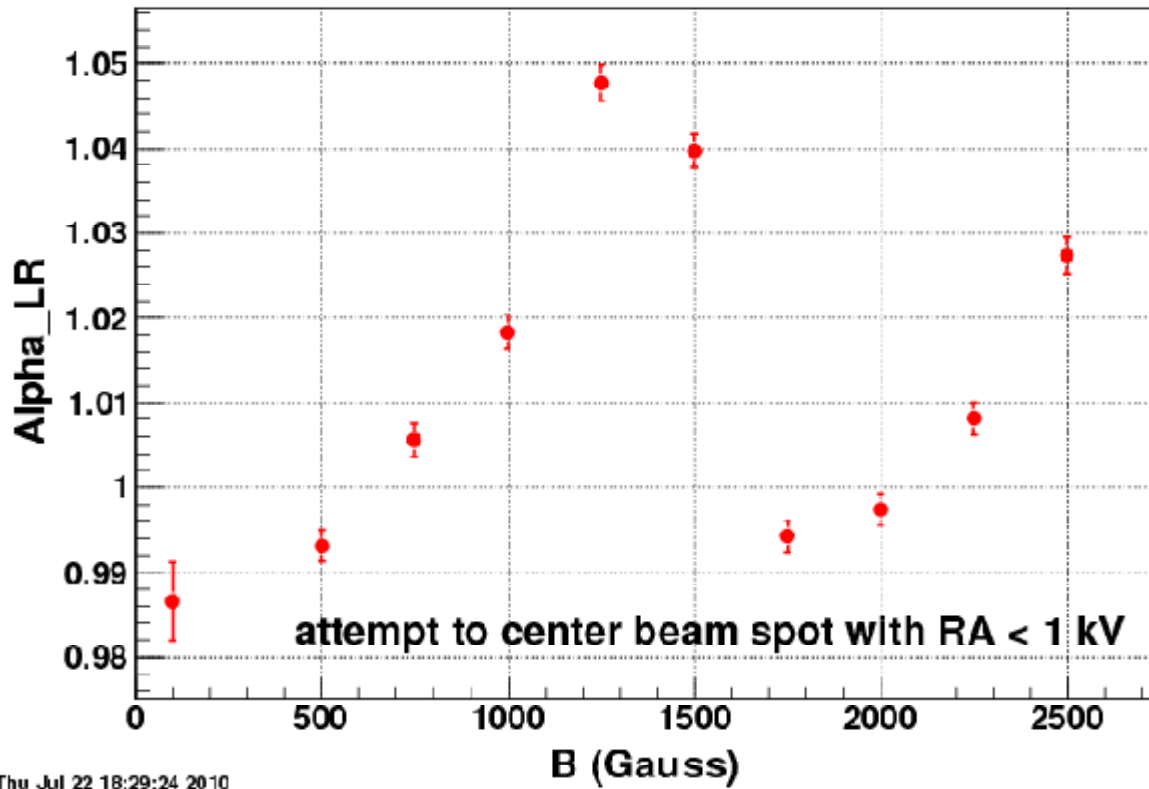
Moderator	7.5
Mod_Guard	6.0
Mod_Grid	5.2
Lense_1	4.25
Mirror	7.5
Lense_2	6.38
Lense_3	3.76
RA-L	4.78
RA-R	4.72
RA-T	4.79
RA-B	4.71

For the above settings, the beam properties are (all from hPos00, MCP2 y%x fine):

Run #	Field (A)	Mean x	Mean y	RMS x	RMS y
956	0	0.24	0.09	6.3	6.3

Attachment 1: [MCP2_B-scan_alphaLR.png](#) 31 kB Uploaded Thu Jul 22 19:53:14 2010
| [Hide](#) | [Hide all](#)

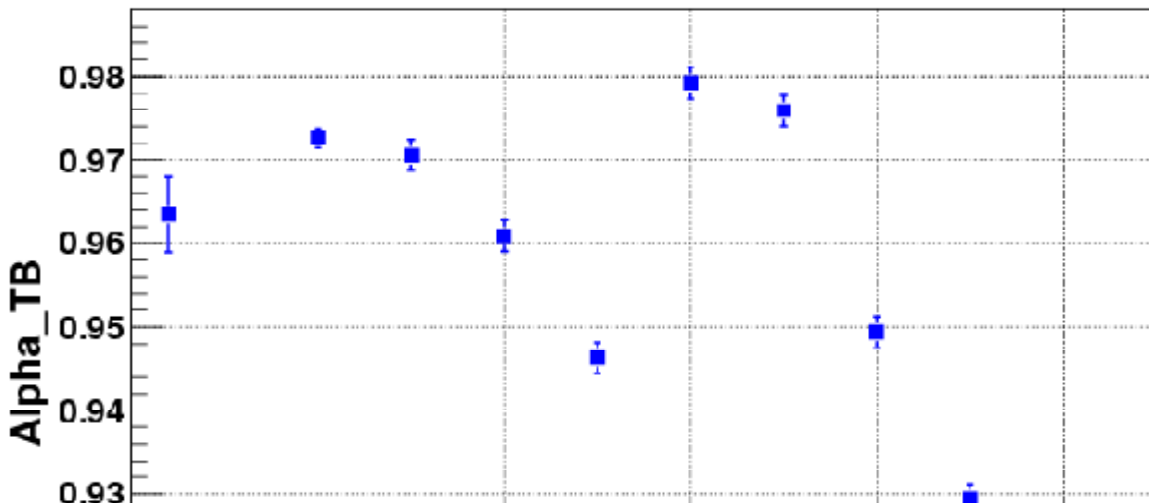
MCP2 field scan, RA off, Cut: , no cut, Alpha_LR

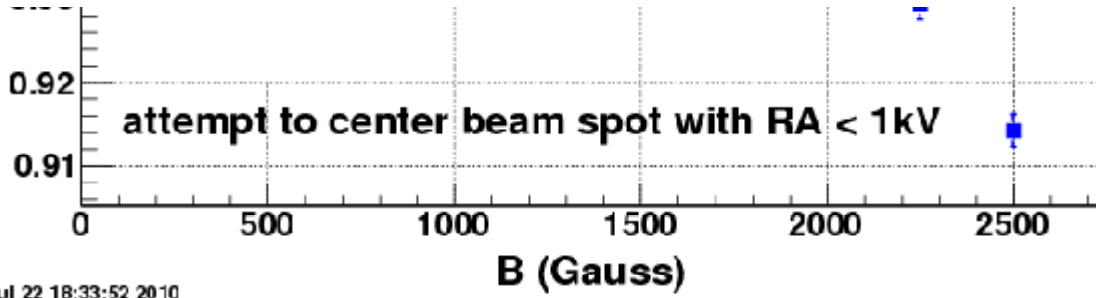


Thu Jul 22 18:29:24 2010

Attachment 2: [MCP2_B-scan_alphaTB.png](#) 30 kB Uploaded Thu Jul 22 19:53:23 2010
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MCP2 field scan, RA off, Cut: , no cut, Alpha_TB



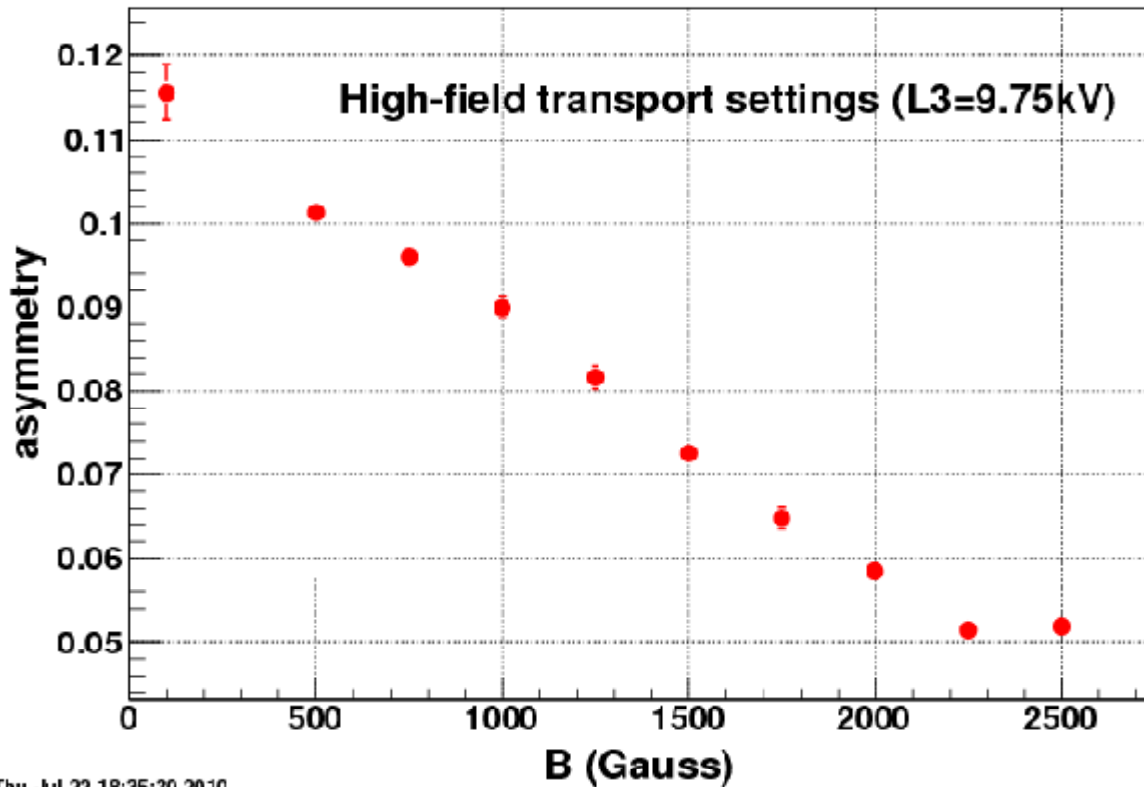


Thu Jul 22 18:33:52 2010

Attachment 3:

MCP2_B-scan_asymmetry.png 30 kB Uploaded Thu Jul 22 19:53:37 2010
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MCP2 field scan, RA off, Cut: , no cut, Asy



Thu Jul 22 18:35:30 2010

Attachment 4:

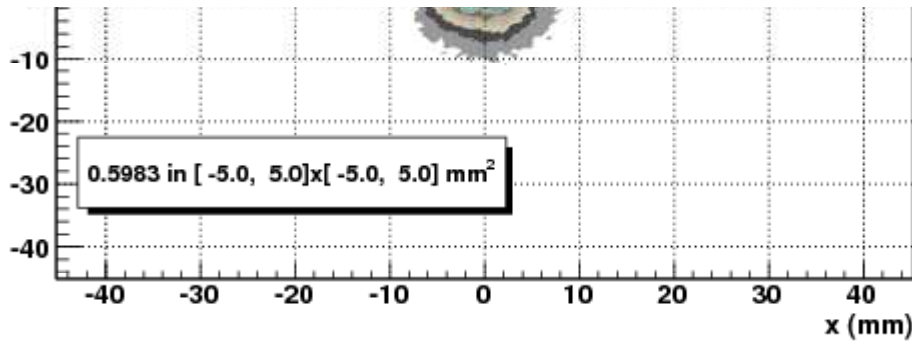
0924_15kV_smallSample_10x10.png 56 kB Uploaded Fri Jul 23 11:52:21 2010
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MCP2 y%x fine (mm) Run lem10_0924

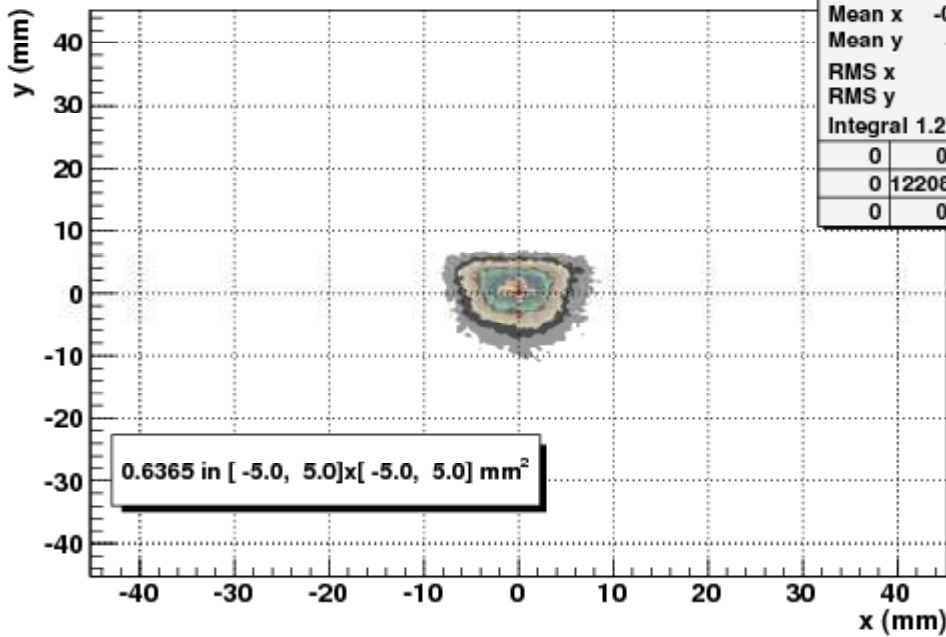
MCP2, ZF WEW, 0A, 15kV small sample, beamspot LE_muons, Ev1 TD'e+, RA-LRTB 11.03-10.97-11.08-10.92



hPos00		
Entries	180112	
Mean x	-0.1074	
Mean y	-0.1293	
MS x	5.548	
RMS y	5.361	
Integral	1.801e+05	
0	0	0
0	180112	0
0	0	0



MCP2 y%x TOF M2F Cut fine (mm) 1600 - 2000 Run lem10_0924



hPos02		
Entries	122089	
Mean x	-0.09586	
Mean y	-0.2049	
RMS x	5.132	
RMS y	4.924	
Integral	1.221e+05	
0	0	0
0	122089	0
0	0	0

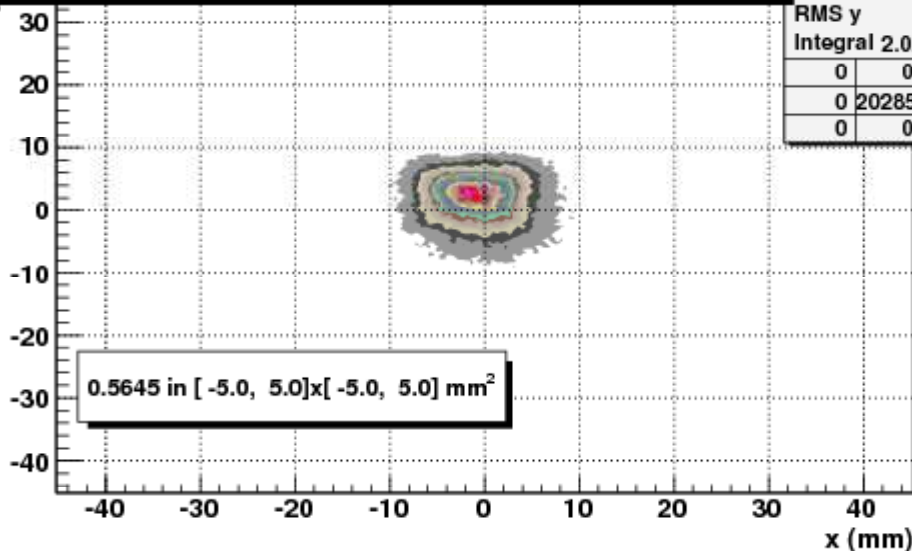
Attachment 5:

[0923_15kV_smallSample_10x10.png](#) 58 kB Uploaded Fri Jul 23 11:52:33 2010

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MCP2 y%x fine (mm) Run lem10_0923

MCP2, ZF WEW, 0A, 15kV small sample, beamspot LE_muons, Ev1 TD'e+, RA-LRTB 11-11-11-11



hPos00		
Entries	202853	
Mean x	-0.6637	
Mean y	1.57	
RMS x	5.521	
RMS y	5.216	
Integral	2.029e+05	
0	0	0
0	202853	0
0	0	0

MCP2 y%x TOF M2F Cut fine (mm) 1600 - 2000 Run lem10_0923

hPos02		
Entries	137427	
Mean x	-0.6955	
Mean y	1.567	
RMS x	5.113	
RMS y	4.758	
Integral	1.374e+05	
0	0	0
0	137427	0
0	0	0

