

Beam Spot Information MERIT Experiment

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VRVS Meeting
CERN – November 30, 2007

Beam Emittance measurement – 14 GeV/c

- Friday 26.10@15:55
- Beam intensity:
- h16, 1E13

File View Option Help

opdisp MDPS 26 Oct 26 16:00:46 2007

Beam State	INJ User	PS User	Particule	Harmonique	Destination
SPARE		MDPS	PROTON	H8H16	TT2_D3

	Aquisition	Losses	Eff (%)
1 ring 1 acc	282.35		
2 ring 2 acc	264.77		
3 ring 3 acc	279.42		
4 ring 4 acc	278.45		
5 Sum PSB acc	1104.99		
6 BTP.TRA	1050.00	55	95.0
7 Injected	1062.71	42	96.2
8 Bef.Trans	1011.40	51	95.2
9 Aft.Trans	1011.40	0	100.0
10 Bef.Eject	1008.96	54	94.9
11 Aft.Eject	-0.43	1009	-0.0
12 TRA126	695.71	313	69.0
13 TRA203	996.75	12	98.8

BLM's	Plot
16	INT
41	5
42	97
43	75
44	81
45	46
f16	26

File Plot Views Option Help

MDPS Oct 26 16:48:31 2007

(VERSION May 14 2007 16:46:17) Measurement mode: Photomultiplier Plot.

Prepare Meas. Parameters Start Measurement

Requested Parameters

- Device V75 (0 scans)
- Occurrence - Any
- Expected Ip - 5e11
- Velocity - 20 m/s
- Single Sweep
- C Timing - 760
- PM Voltage 1 V75 - 480
- PM Voltage 2 V75 - 480
- Scint. Trans. V75 - 100%

Results for V75

At C Pulse : 760

e (2s) (mm.mrad) 0.68

e (2s) (normalised) 10.28

4s measured (mm) 5.65

Centre of Mass (mm) 3.31

Measurement Parameters

At C Pulse : 760

B Pulse (1G Train) 6667

p (GeV/c) 13.99

Ip (E10) 986.97

Device : V75

PM Voltage (V) 3129

b (m) 11.6

Dispersion (m.) - -

Scint. Transmission 100%

WARNING The graphs displayed may not correspond to the requested settings.

Plot Views Option Help

MDPS Oct 26 16:42:20 2007

(VERSION May 14 2007 16:46:17) Measurement mode: Photomultiplier Plot.

Prepare Meas. Parameters Start Measurement

Requested Parameters

- Device H64 (0 scans)
- Occurrence - Any
- Expected Ip - 5e11
- Velocity - 20 m/s
- Single Sweep
- C Timing - 760
- PM Voltage 1 H64 - 450
- PM Voltage 2 H64 - 450
- Scint. Trans. H64 - 100%

Results for H64

At C Pulse : 760

e (2s) (mm.mrad) 1.02

e (2s) (normalised) 15.33

4s measured (mm) 10.62

Centre of Mass (mm) -3.26

Measurement Parameters

At C Pulse : 760

B Pulse (1G Train) 6667

p (GeV/c) 13.99

Ip (E10) 1008.96

Device : H64

PM Voltage (V) 3129

b (m) 12.6

Dispersion (m.) 2.30

Scint. Transmission 100%

WARNING The graphs displayed may not correspond to the requested settings.

Beam Emittance measurement – 14 GeV/c

Friday 26.11 @ 17:37


Beam intensity:

- 2.5E11/bunch
- 2 extracted bunches,
- DT=1.7us

File View Option Help

opdisp MDPS 26 Oct 26 18:06:46 2007

Beam State	IMJ User	PS User	Particule	Harmonique	Destination
SPARE		MDPS	PROTON	H8H16	TT2_D3



	Acquisition	Losses	Eff (%)	
1 ring 1 acc	-0.00			
2 ring 2 acc	-0.01			
3 ring 3 acc	119.00			
4 ring 4 acc	-0.00			
5 Sum PSB acc	118.98			
6 BTP.TRA	126.25	-7	106.1	5
7 Injected	114.53	4	96.3	5
8 Bef.Trans	111.48	3	97.3	7
9 Aft.Trans	111.11	0	99.7	8
10 Bef.Eject	111.23	3	97.1	7
11 Aft.Eject	54.33	57	48.8	10
12 TRA126	55.23	56	49.7	10
13 TRA203	53.20	58	47.8	10
14 TRA386	54.40	57	48.9	10

BLM's Plot	
	INT
16	12
41	0
42	17
43	8
44	17
45	6
f16	1

File Plot Views Option Help

fws MDPS Oct 26 18:12:31 2007

(VERSION May 14 2007 16:46:17) Measurement mode: Photomultiplier Plot.

Prepare Meas. Parameters Start

Requested Parameters

Device V75 (0 scans)

Occurrence - Any

Expected Ip - 5e11

Velocity - 20 m/s

Single Sweep

C Timing - 760

PM Voltage 1 V75 - 620

PM Voltage 2 V75 - 620

Scint. Trans. V75 - 100%

Results for V75

At C Pulse : 760

e (2s) (mm.mrad) 0.32

e (2s)(normalised) 4.80

4s measured (mm) 3.86

Centre of Mass (mm) 3.37

Measurement Parameters

At C Pulse : 760

B Pulse (1G Train) 6667

p (GeV/c) 13.99

Ip (E10) 112.58

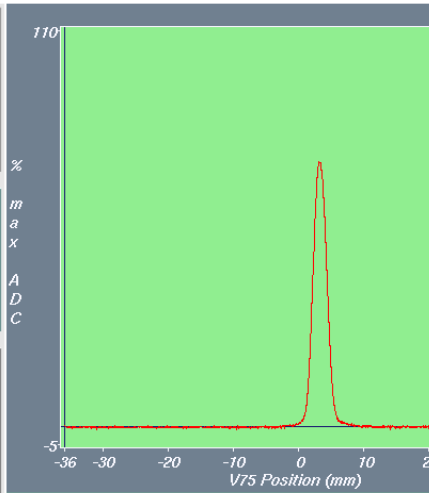
Device : V75

PM Voltage (V) 3129

b (m) 11.6

Dispersion (m.) --

Scint. Transmission 100%



WARNING The graphs displayed may not correspond to the requested settings.

File Plot Views Option Help

fws MDPS Oct 26 18:15:53 2007

(VERSION May 14 2007 16:46:17) Measurement mode: Photomultiplier Plot.

Prepare Meas. Parameters Start Measurement

Requested Parameters

Device H64 (0 scans)

Occurrence - Any

Expected Ip - 5e11

Velocity - 20 m/s

Single Sweep

C Timing - 760

dp/p for C760 - 1.66

PM Voltage 1 H64 - 600

PM Voltage 2 H64 - 600

Scint. Trans. H64 - 100%

Results for H64

At C Pulse : 760

e (2s) (mm.mrad) 0.40

e (2s)(normalised) 5.94

4s measured (mm) 8.85

Centre of Mass (mm) -3.98

Measurement Parameters

At C Pulse : 760

B Pulse (1G Train) 6667

p (GeV/c) 13.99

Ip (E10) 110.62

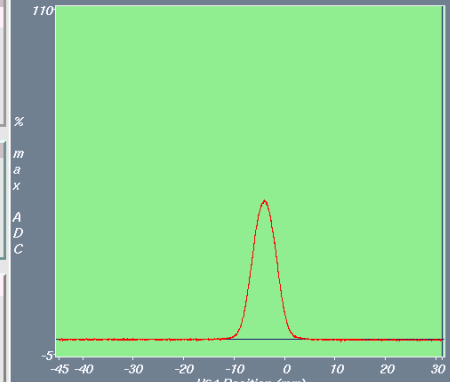
Device : H64

PM Voltage (V) 3129

b (m) 12.6

Dispersion (m.) 2.30

Scint. Transmission 100%



WARNING The graphs displayed may not correspond to the requested settings.

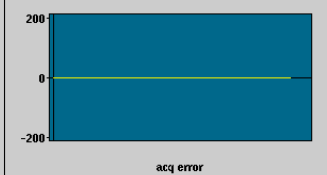
Beam Emittance measurement – 14 GeV/c

- Friday 26.10@18:24
- Beam intensity:**
- 1.3E12/bunch
- 2 extracted bunches,
- DT=1.7us

File View Option Help

opdisp MDPS 26 Oct 26 18:26:56 2007

Beam State	INJ User	PS User	Particule	Harmonique	Destination
SPARE		MDPS	PROTON	H8H16	TT2_D3



	Aquisition	Losses	Eff (%)
1 ring 1 acc	-0.01		
2 ring 2 acc	-0.06		
3 ring 3 acc	488.50		
4 ring 4 acc	0.01		
5 Sum PSB acc	488.44		
6 BTP.TRA	457.50	31	93.7
7 Injected	456.84	32	93.5
8 Bef.Trans	451.96	5	98.9
9 Aft.Trans	449.51	2	99.5
10 Bef.Eject	447.07	10	97.9
11 Aft.Eject	203.30	244	45.5
12 TRA126	168.98	278	37.8
13 TRA203	222.75	224	49.8
14 TRA386	281.25	166	62.9

BLM's Plot	
	INT
16	140
41	29
42	255
43	255
44	255
45	255
f16	4

File Plot Views Option Help

fws MDPS Oct 26 18:36:03 2007

(VERSION May 14 2007 16:46:17) Measurement mode: Photomultiplier Plot.

Prepare Meas. Parameters

Requested Parameters

Device V75 (0 scans)

Occurrence - Any

Expected Ip - 5e11

Velocity - 20 m/s

Single Sweep

C Timing - 760

PM Voltage 1 V75 - 580

PM Voltage 2 V75 - 580

Scint. Trans. V75 - 100%

Results for V75

At C Pulse : 760

e (2s) (mm.mrad) 1.02

e (2s)(normalised) 15.34

4s measured (mm) 6.90

Centre of Mass (mm) 3.35

Measurement Parameters

At C Pulse : 760

B Pulse (1G Train) 6667

p (GeV/c) 13.99

Ip (E10) 442.18

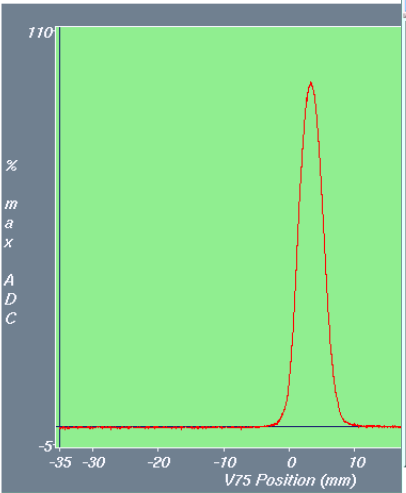
Device : V75

PM Voltage (V) 3129

b (m) 11.6

Dispersion (m.) --

Scint. Transmission 100%



W75 Position (mm)

WARNING The graphs displayed may not correspond to the requested settings.

File Plot Views Option Help

fws MDPS Oct 26 18:32:41 2007

(VERSION May 14 2007 16:46:17) Measurement mode: Photomultiplier Plot.

Prepare Meas. Parameters Start Measurement

Requested Parameters

Device H64 (0 scans)

Occurrence - Any

Expected Ip - 5e11

Velocity - 20 m/s

Single Sweep

C Timing - 760

dp/p for C760 - 1.76

PM Voltage 1 H64 - 540

PM Voltage 2 H64 - 540

Scint. Trans. H64 - 100%

Results for H64

At C Pulse : 760

e (2s) (mm.mrad) 1.73

e (2s)(normalised) 25.82

4s measured (mm) 12.36

Centre of Mass (mm) -3.75

Measurement Parameters

At C Pulse : 760

B Pulse (1G Train) 6667

p (GeV/c) 13.99

Ip (E10) 439.74

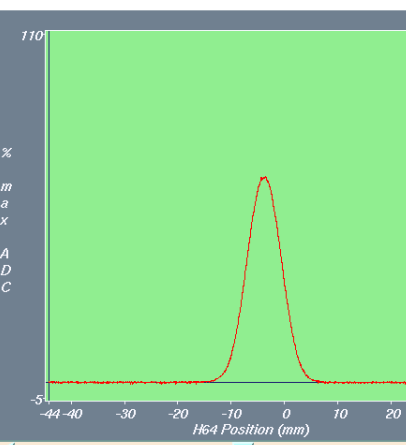
Device : H64

PM Voltage (V) 3129

b (m) 12.6

Dispersion (m.) 2.30

Scint. Transmission 100%

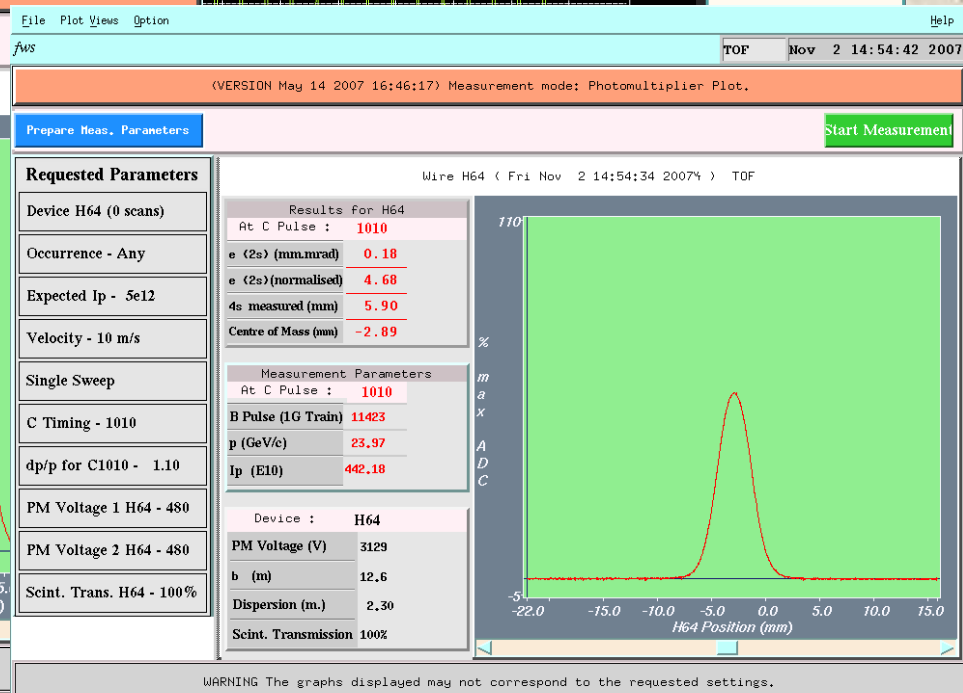
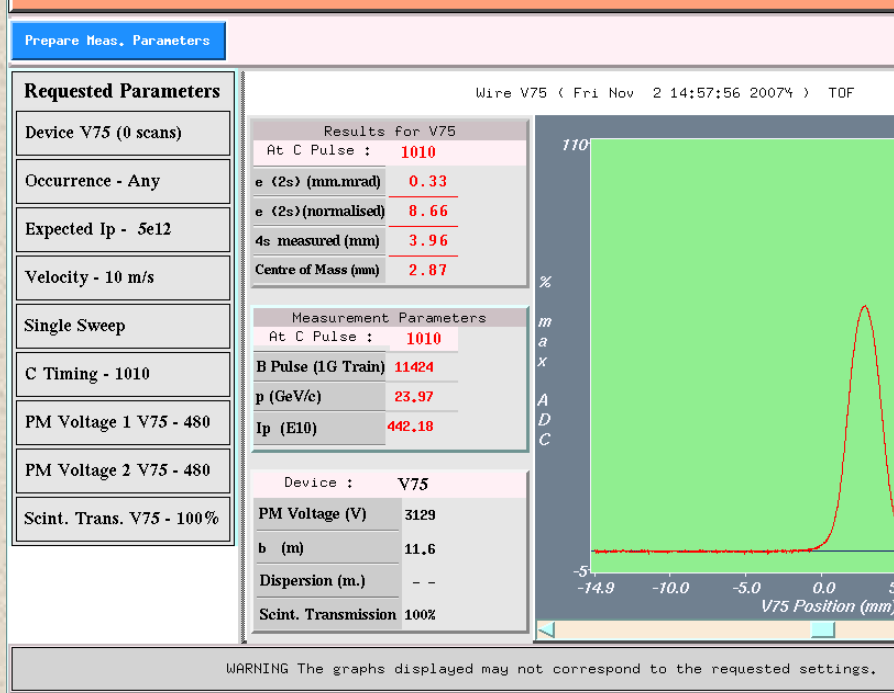
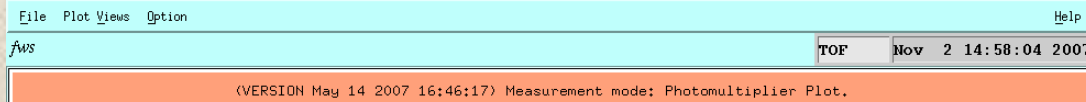
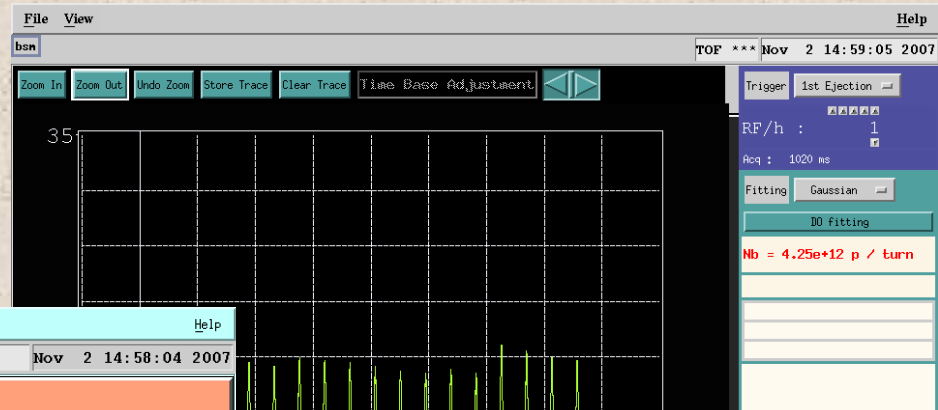


H64 Position (mm)

WARNING The graphs displayed may not correspond to the requested settings.

Beam Emittance measurement – 24 GeV/c

- Friday 02.11 @ 14:55PM
- Beam intensity:**
- 2.5E11/bunch
- 16 bunches



Beam Emittance measurement – 24 GeV/c

□ Friday 02.11 @ 16:02PM

Beam intensity:

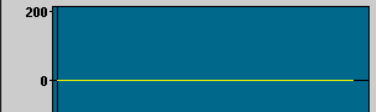
□ 16 bunches,

□ 6E12 protons

File View Option Help

opdisp TOF 28 Nov 2 16:03:28 2007

Beam State	INJ User	PS User	Particule	Harmonique	Destination
SPARE		TOF	PROTON	H8	TT2_D3



	Aquisition	Losses	Eff (%)
1 ring 1 acc	159.15		
2 ring 2 acc	166.48		
3 ring 3 acc	161.79		
4 ring 4 acc	161.60		
5 Sum PSB acc	649.02		
6 BTP.TRA	630.00	19	97.1
7 Injected	632.74	16	97.5
8 Bef.Trans	613.19	20	96.9
9 Aft.Trans	608.31	5	99.2
10 Bef.Eject	608.31	24	96.1
11 Aft.Eject	0.15	608	0.0
12 TRA126	6.26	602	1.0
13 TRA203	560.25	48	92.1
14 TRA386	632.25	-24	103.9

BLM's	Plot
16	6
41	4
42	29
43	24
44	34
45	16
f16	46

File Plot Views Option Help

fws TOF Nov 2 16:03:01 2007

(VERSION May 14 2007 16:46:17) Measurement mode: Photomultiplier Plot.

Prepare Meas. Parameters Start Measurement

Requested Parameters

Device V75 (0 scans)

Occurrence - Any

Expected Ip - 5e12

Velocity - 10 m/s

Single Sweep

C Timing - 1010

PM Voltage 1 V75 - 480

PM Voltage 2 V75 - 480

Scint. Trans. V75 - 100%

Results for V75

At C Pulse : 1010

e (2s) (mm.mrad) 0.44

e (2s) (normalised) 11.35

4s measured (mm) 4.54

Centre of Mass (mm) 2.94

Measurement Parameters

At C Pulse : 1010

B Pulse (1G Train) 11424

p (GeV/c) 23.97

Ip (E10) 615.64

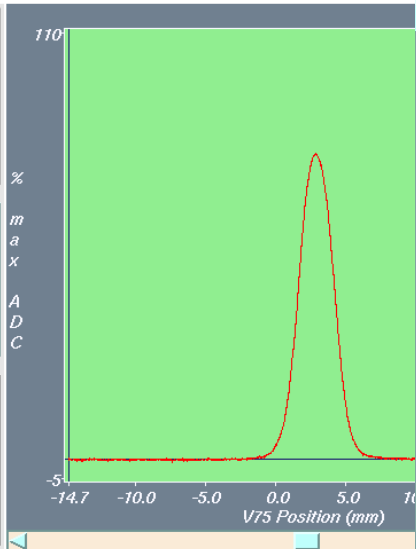
Device : V75

PM Voltage (V) 3129

b (m) 11.6

Dispersion (m.) --

Scint. Transmission 100%



Wire V75 (Fri Nov 2 16:02:53 2007) TOF

File Plot Views Option Help

fws TOF Nov 2 16:07:30 2007

(VERSION May 14 2007 16:46:17) Measurement mode: Photomultiplier Plot.

Prepare Meas. Parameters Start Measurement

Requested Parameters

Device H64 (0 scans)

Occurrence - Any

Expected Ip - 5e12

Velocity - 10 m/s

Single Sweep

C Timing - 1010

dp/p for C1010 - 1.10

PM Voltage 1 H64 - 460

PM Voltage 2 H64 - 460

Scint. Trans. H64 - 100%

Results for H64

At C Pulse : 1010

e (2s) (mm.mrad) 0.25

e (2s) (normalised) 6.45

4s measured (mm) 6.18

Centre of Mass (mm) -2.88

Measurement Parameters

At C Pulse : 1010

B Pulse (1G Train) 11423

p (GeV/c) 23.97

Ip (E10) 618.08

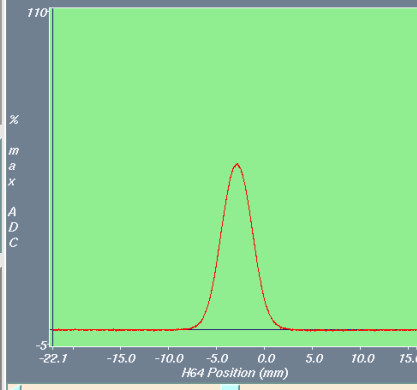
Device : H64

PM Voltage (V) 3129

b (m) 12.6

Dispersion (m.) 2.30

Scint. Transmission 100%



Wire H64 (Fri Nov 2 16:07:22 2007) TOF

File Plot Views Option Help

fws TOF Nov 2 16:07:30 2007

(VERSION May 14 2007 16:46:17) Measurement mode: Photomultiplier Plot.

Prepare Meas. Parameters Start Measurement

WARNING The graphs displayed may not correspond to the requested settings.

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Beam spot size – optics & emittance

- From the beam optics and the measured emittances we can calculate the beam spot at various locations:

Date	Pbeam [GeV/c]	Intensity				Horizontal			Vertical			dp/p [%]
		Bef.Eject	TRA126	TRA283	TRA386	e(2s)	e(2s)	4s meas	e(2s)	e(2s)	4s meas	
		[e10]				[mm.mrad]	[norm]	[mm]	[mm.mrad]	[norm]	[mm]	
26-Oct	14	1008.96	695.71	996.75	1037.25	1.02	15.33	10.62	0.68	10.28	5.64	1.7
26-Oct	14	111.23	55.23	53.2	54.4	0.4	5.94	8.85	0.32	4.8	3.86	1.66
26-Oct	14	447.07	168.98	222.75	281.25	1.73	25.82	12.36	1.02	15.34	6.9	1.76
2-Nov	24				425	0.18	4.68	5.9	0.33	8.66	3.96	1.1
2-Nov	24	608.31	6.26	560.25	632.25	0.25	6.45	6.18	0.44	11.35	4.54	1.1

MTV454			MTV484			Hg-trg-U			Hg-targ			Hg-targ-D		
Position=-5.77m			Position=-4.17m			Position=-0.7m			Position=0.0m			Position=+2.9m		
Dimxc	Dimyc	Spot	Dimxc	Dimyc	Spot	Dimxc	Dimyc	Spot	Dimxc	Dimyc	Spot	Dimxc	Dimyc	Spot
[mm]	[mm]	[mm2]	[mm]	[mm]	[mm2]	[mm]	[mm]	[mm2]	[mm]	[mm]	[mm2]	[mm]	[mm]	[mm2]
2.55	2.61	6.64	2.04	1.97	4.01	1.33	0.86	1.14	1.31	0.80	1.05	1.80	1.49	2.67
1.59	1.79	2.85	1.28	1.35	1.72	0.83	0.59	0.49	0.82	0.55	0.45	1.13	1.02	1.15
3.31	3.19	10.59	2.65	2.41	6.40	1.73	1.05	1.82	1.71	0.98	1.67	2.34	1.82	4.26
1.07	1.82	1.94	0.86	1.37	1.17	0.56	0.60	0.33	0.55	0.56	0.31	0.76	1.04	0.78
1.26	2.10	2.64	1.01	1.58	1.60	0.66	0.69	0.45	0.65	0.64	0.42	0.89	1.20	1.06

From MTV screens:

- The optics predict a smaller beam in Vertical; however the screen shots in the MTV screens show the opposite!
- Logbook: [23.10@11:31](#), 14GeV/c beam, 1.48e11 protons

