

High Order extended configuration

Version 9.8.176
from 12/24/2014

[Link: Spectrometer “MSP-144” \(FLNR/JINR\)](#)

- MSP-144 extended configurations in LISE⁺⁺
- Introduction
- Configurations
- Angular Acceptance
- Momentum Acceptance
- Envelopes
- Turn of the spectrometer

Configuration files

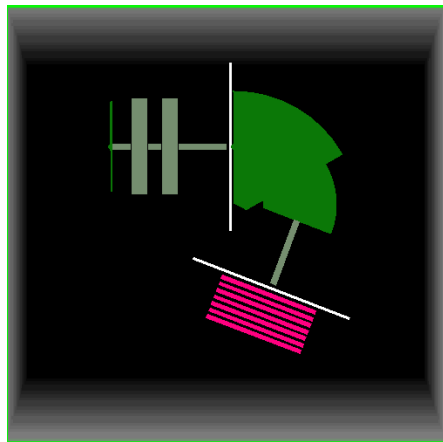
Path /config/Dubna/

Vise\config\Dubna*.*			
Name	Ext	Size	Date
[.]	<DIR>		12/24/2014
Acculinna	lcn	16,163	07/01/2003
Acculinna2_extended	lcn	269,177	02/18/2013
COMBAS	lcn	18,801	07/01/2003
Dubna_GFS	lcn	16,551	11/04/2003
eMSP144	lcn	78,041	12/24/2014
MASHA	lcn	21,601	01/13/2004
MSP144	lcn	35,516	07/01/2003
SHELS	lcn	156,911	11/26/2014
Vassilissa	lcn	32,332	01/13/2004

LISE++ files

Path /files/examples/dubna/

Vise\files\examples\dubna*.*			
Name	Ext	Size	Date
[.]	<DIR>		12/24/2014
acculinna_6he	lpp	46,201	02/16/2012
acculinna2	lpp	287,285	02/06/2013
acculinna2_extended	lpp	287,269	02/18/2013
combas_test	lpp	42,159	02/16/2012
Dubna_GFS	lpp	39,955	02/16/2012
eMSP144	lpp	97,631	12/24/2014
Masha	lpp	42,496	02/16/2012
msp144_48ca	lpp	53,135	02/16/2012
SHELS	lpp	184,666	11/26/2014
vassilissa_22ne_au_states	lpp	54,837	02/16/2012



P	Projectile	20Ne ¹⁰⁺
		23.65 MeV/u 1 pA
F	Fragment	20Ne ¹⁰⁺ =beam+
T	Target	
Str	Stripper	
D	tuning	Brho 1.4084 Tm
S	_dr1	standard 32.2 cm
Q	Quad1	QUAD -5.6 kG
S	_dr2	standard 25 cm
Q	Quad2	QUAD 5.4 kG
S	_dr3	standard 87.6 cm
S	_dr3a	slits
D	Dipole 1	Brho 1.4084 Tm
D	Dipole 2	Brho 1.4084 Tm
S	_dr5	standard 1.25 m
S	frame	slits
		-120 +120
		-30 +30
M	Window	H8C10O4 5 m cren
M	dE1	H10C4 82150.8 m cren
M	Material 3	H10C4 3800 m cren
M	dE2	H10C4 117826 m cren
M	Material 5	H10C4 3600 m cren
M	dE3	H10C4 404129 m cren
M	Veto	H10C4 14000 m cren

Note: It's an extended configuration! For details on extended configuration approach please use the next link

http://lise.nsci.msu.edu/9_8/LISE3/Extended%20configurations%20at%20LISE++.pdf

2014: Two quadrupoles have to be inserted between the target box and the separator in order to increase angular acceptance

MSP – 144 information:

Nuclear Instruments and Methods in Physics Research A 411 (1998) 343–350

**NUCLEAR
INSTRUMENTS
& METHODS
IN PHYSICS
RESEARCH**
Section A

A facility for the study of neutron-rich light nuclei

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Yu.E. Penionzhkevich^a, V.S. Salamatina^a, V.E. Zhuchko^a

Table 1
Some parameters of MSP-144

Gap of 1st dipole region (mm)	47
Gap of 2nd dipole region (mm)	30
Max. magnetic rigidity, $B\rho$ (Tm)	1.5
Focal line angle (deg)	41
Relation of energy, E_{max}/E_{min}	5.2
Energy resolution, $\Delta E/E$	5×10^{-4}

- the MSP-144 positioned at a reaction angle of 4° ,
- the 8 mm width of the entrance slit of the MSP-144,
- the diaphragm with a $170 \times 20 \text{ mm}^2$ aperture placed beyond the entrance pole edges at a distance of 751 mm from the target.

This disposition of the MSP-144 determines the entrance solid angle of 0.49 msr.

4. Detector performance

The focal plane detector [6] consists of a gas filled, gridded ionization chamber with a segmented anode and two single wire proportional counters. A schematic cross section of the focal plane detector is shown in Fig. 4.

We used an ionization chamber 500 mm deep, 240 mm wide and 65 mm high. The distance between the anode and the Frisch grid and between the Frisch grid and the cathode is 8 and 37 mm.

NUCLEAR INSTRUMENTS AND METHODS 126 (1975) 413–416; © NORTH-HOLLAND PUBLISHING CO.

A BROAD-RANGE STEPPED-POLE MAGNETIC SPECTROGRAPH

YU. G. BASARGIN, N. I. BOLDIN, L. E. KOROLEV, V. G. LEVCHENKO and YU. P. SEVERGIN
D. V. Efremov Scientific Research Institute of Electrophysical Apparatus, Leningrad, USSR
and
YU. V. GOFMAN and V. Z. MAIDIKOV

In the described broad-range spectrograph the momenta of simultaneously recorded particles differ by a factor of 2.6. The maximum radius of the central trajectory in the region I is $\rho_{1max} = 125 \text{ cm}$; the field-strength ratio in the two regions is $K = 1.55$. The angle of deflection in the first region is 60° , in the second one is 51° . In the region I the entrance “edge” angle is $\varepsilon_1 = +60^\circ$, the exit one $\varepsilon_2 = -60^\circ$, and in the region II $\varepsilon_1 = +60^\circ$ and $\varepsilon_2 = -28.5^\circ$. The source-to-entrance boundary spacing is 62.5 cm. The smaller gap width (in the region II) is 30 mm, the bigger gap width is 47 mm. The focal line is 150 cm long and it differs from a straight line not more than $\pm 5 \text{ mm}$; the focal-line slope with respect to the central trajectories is 40° .

The calculated dependences of the magnetic-field

There were three sources to build QQDD configuration

1. "MSP-144_X" COSY file. This file contains 70 mm aperture quads. Effective quad length used in the configuration corresponds to the "coef" =0.9, where $L_{eff} = L_{iron} + HalfAperture * coef$. Using this COSY file the LISE++ file "[eMSP144_cosyX.lpp](#)" has been created. Large X-magnification (2.48) and defocusing (0.5 mm/mrad) values been obtained with both COSY and LISE++ calculations.
2. "MSP-144_Y" COSY file. This file contains 110 mm aperture quads. Effective quad length used in the configuration corresponds to the "coef" =0.9, where $L_{eff} = L_{iron} + HalfAperture * coef$. Using this COSY file the LISE++ file "[eMSP144_cosyY.lpp](#)". Smaller X-magnification (0.15) and defocusing (-0.29 mm/mrad) values been obtained with both COSY and LISE++ calculations.
3. The third source was a MSP144 sketch with drift distances. The "eMSP144.lpp" LISE++ file has been created on this sketch and some parameters taken from "MSP-144_Y" COSY file. For effective quad lengths the "coef" has been used equal to 0.7 which was obtain in measurement in Dubna (SHELS) and MSU (A1900).

a. Q2-field "0.54 T" provides zero X-magnification : "[eMSP144_a.lpp](#)"

b. Q2-field "0.603 T" provides X-focus at the end of spectrometer : "[eMSP144_b.lpp](#)"

Global matrix						
2.4796	0.05233	0	0	0	1.51463	[cm]
74.323	1.97187	0	0	0	-0.12864	[mrad]
0	0	8.58226	-0.30827	0	0	[cm]
0	0	51.48136	-1.73265	0	0	[mrad]
11.28911	0.29934	0	0	1	-1.20456	[cm]
0	0	0	0	0	1	[%]

Global matrix						
0.15006	-0.02898	0	0	0	1.51749	[cm]
31.51222	0.57701	0	0	0	-0.12867	[mrad]
0	0	5.78907	-0.34061	0	0	[cm]
0	0	36.35833	-1.96651	0	0	[mrad]
4.78397	0.08719	0	0	1	-1.20457	[cm]
0	0	0	0	0	1	[%]
/[cm]	/[mrad]	/[cm]	/[mrad]	/[cm]	/[%]	

Global matrix						
0.03933	-0.03302	0	0	0	1.51749	[cm]
29.63297	0.55087	0	0	0	-0.12864	[mrad]
0	0	3.4684	-0.29538	0	0	[cm]
0	0	24.32144	-1.783	0	0	[mrad]
4.49728	0.08317	0	0	1	-1.20456	[cm]
0	0	0	0	0	1	[%]
/[cm]	/[mrad]	/[cm]	/[mrad]	/[cm]	/[%]	

Global matrix						
0.5166	-0.00016	0	0	0	1.51749	[cm]
49.51072	1.92071	0	0	0	-0.12865	[mrad]
0	0	3.51039	-0.31344	0	0	[cm]
0	0	24.68305	-1.91904	0	0	[mrad]
7.51983	0.29146	0	0	1	-1.20456	[cm]
0	0	0	0	0	1	[%]

Important: in the COSY files half-apertures of 5 cm were used for both dipoles. In reality the values of 2.3 cm and 1.5 cm should be set. These values defines vertical acceptance and important for matrix calculations. The final file "eMSP144.lpp" used these last values.

COSY

	Lengths mm			fileds	Quad-eff coef	HalfApp
	effective	iron	delta			
drift	100	115				
quad1	330	300	15	-0.55	0.857	35
drift	220	250				
quad2	330	300	15	0.45	0.857	35
drift	825	840				
D1	g/2	5	cm			
D2	g/2	5	cm			
drift	1470					

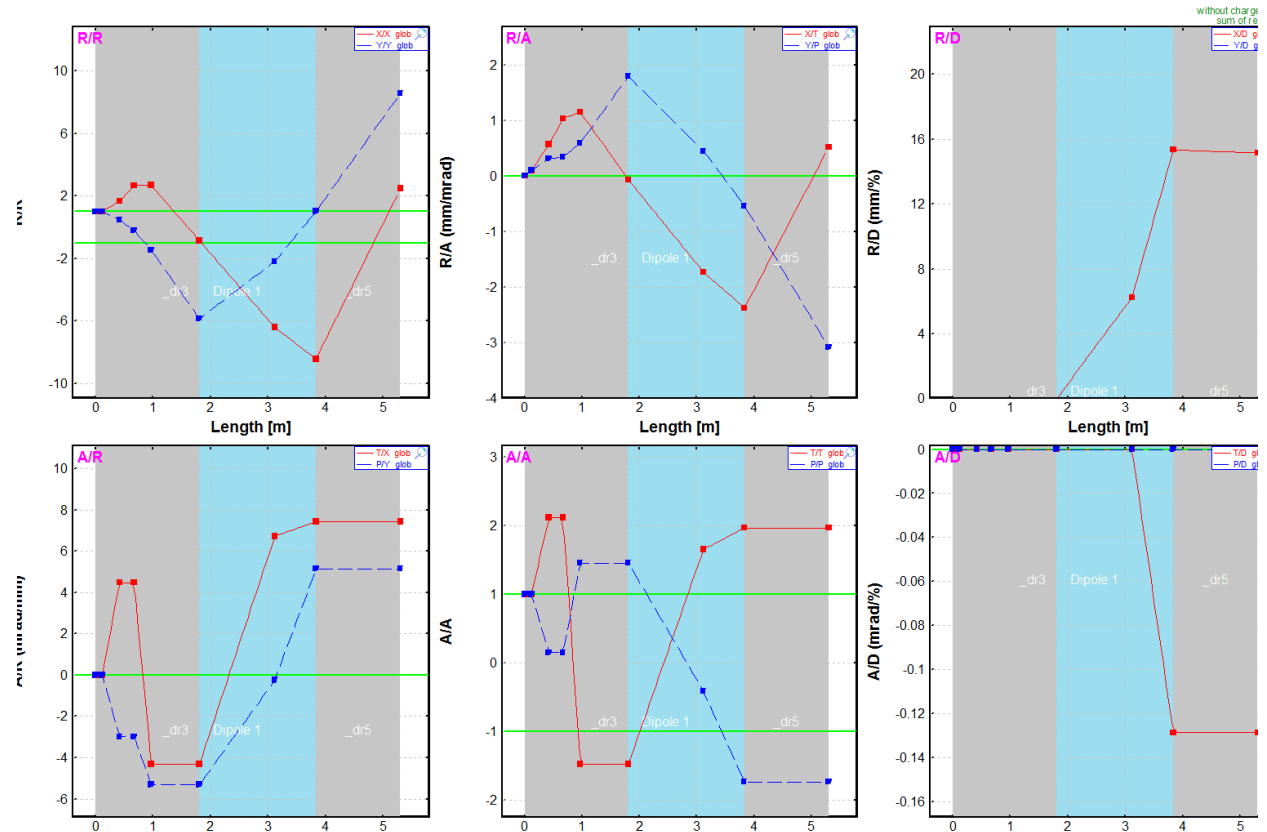
```

6 1
.24763E+01 .52193E-01 .00000E+00 .00000E+00 .00000E+00 .15146E+01
.74245E+02 .19687E+01 .00000E+00 .00000E+00 .00000E+00 -.12864E+00
.00000E+00 .00000E+00 .85781E+01 -.30835E+00 .00000E+00 .00000E+00
.00000E+00 .00000E+00 .51456E+02 -.17330E+01 .00000E+00 .00000E+00
.11277E+02 .29886E+00 .00000E+00 .00000E+00 .10000E+01 -.12046E+01
.00000E+00 .00000E+00 .00000E+00 .00000E+00 .00000E+00 .10000E+01
    
```

²⁰Ne (23.7 MeV/u); Settings on ²⁰Ne; Config: SSSSDSSMMMMMM
 dp/p=66.02% ; Brho(Tm): 1.4084, 1.4084

LISE++

Global matrix					
2.4796	0.05233	0	0	0	1.51463 [cm]
74.323	1.97187	0	0	0	-0.12864 [mrad]
0	0	8.58226	-0.30827	0	0 [cm]
0	0	51.48136	-1.73265	0	0 [mrad]
11.28911	0.29934	0	0	1	-1.20456 [cm]
0	0	0	0	0	1 [%]



COSY

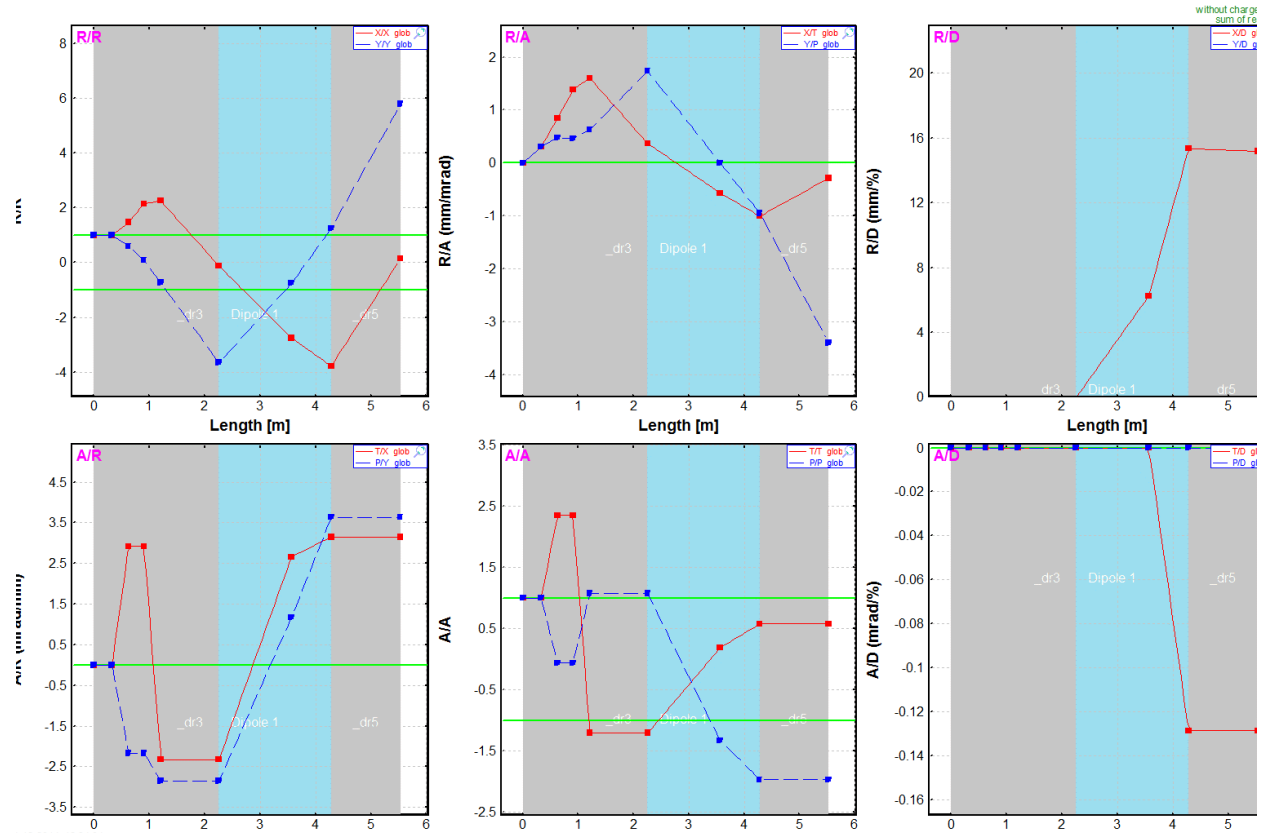
6 1

.14881E+00	-.29079E-01	.00000E+00	.00000E+00	.00000E+00	.15175E+01
.31457E+02	.57299E+00	.00000E+00	.00000E+00	.00000E+00	-.12864E+00
.00000E+00	.00000E+00	.57849E+01	-.34072E+00	.00000E+00	.00000E+00
.00000E+00	.00000E+00	.36333E+02	-.19671E+01	.00000E+00	.00000E+00
.47755E+01	.86577E-01	.00000E+00	.00000E+00	.10000E+01	-.12046E+01
.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.10000E+01

BLOCK	Lengths mm			fileds	Quad-eff coef	HalfApp
	effective	iron	delta			
drift	300	325				
quad1	350	300	25	-0.56	0.909	55
drift	230	280				
quad2	350	300	25	0.492	0.909	55
drift	1025	1050				
D1	g/2	5	cm			
D2	g/2	5	cm			
drift	1248					

LISE++

²⁰Ne (23.7 MeV/u); Settings on ²⁰Ne; Config: SSSSDDSSMMMMMM
dp/p=65.90% ; Brho(Tm): 1.4084, 1.4084



Global matrix

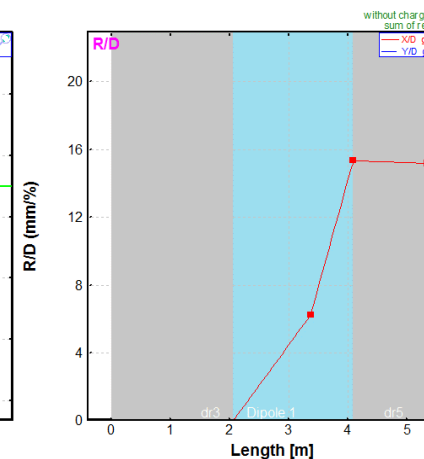
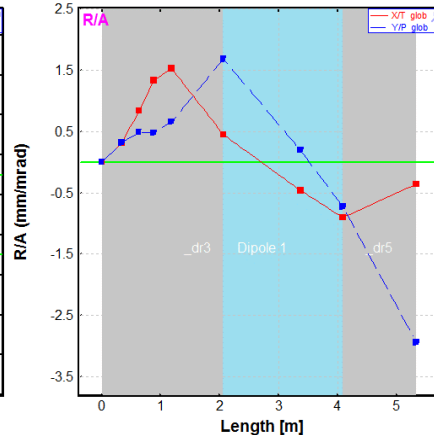
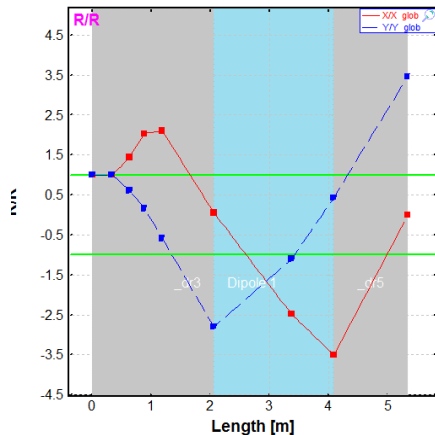
0.15006	-0.02898	0	0	0	1.51749	[cm]
31.51222	0.57701	0	0	0	-0.12867	[mrad]
0	0	5.78907	-0.34061	0	0	[cm]
0	0	36.35833	-1.96651	0	0	[mrad]
4.78397	0.08719	0	0	1	-1.20457	[cm]
0	0	0	0	0	1	[%]
/[cm]	/[mrad]	/[cm]	/[mrad]	/[cm]	/[%]	

	Lengths mm			files	Quad-eff coef
	effective	iron	delta		
drift	312.75	332		-0.56	0.700
quad1	338.5	300	19.25		
drift	211.5	250			
quad2	338.5	300	19.25	0.54	0.700
drift	858.75	878			
D1	g/2	2.35	cm		
D2	g/2	1.5	cm		
drift	1470				
Here is zero X-magnification					

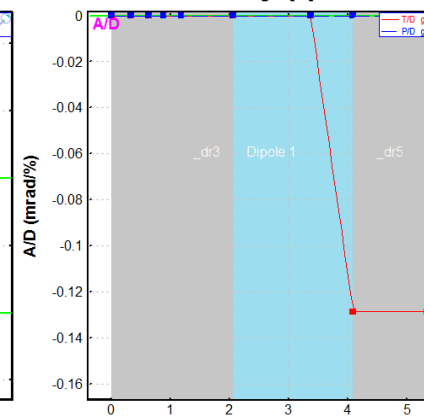
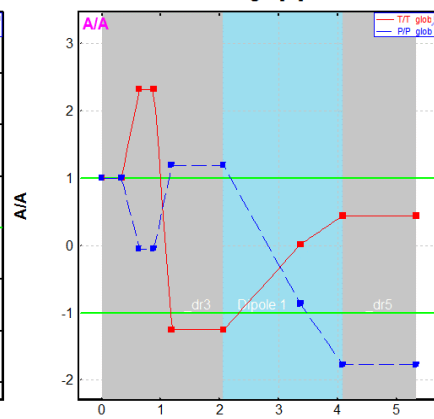
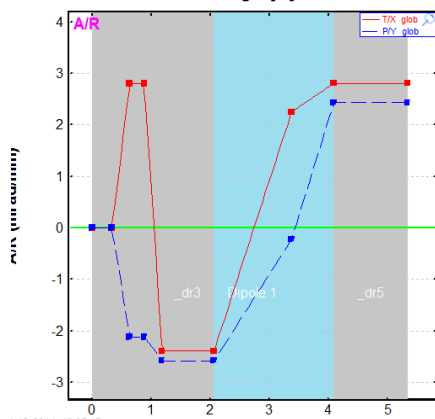
Changed according to the original MSP144 information

²⁰Ne (23.7 MeV/u); Settings on ²⁰Ne; Config: SSSSSDDSSMMMMMM
dp/p=15.82% ; Brho(Tm): 1.4084, 1.4084

LISE++



Global matrix						
0.03933	-0.03302	0	0	0	1.51749	[cm]
29.63297	0.55087	0	0	0	-0.12864	[mrad]
0	0	3.4684	-0.29538	0	0	[cm]
0	0	24.32144	-1.783	0	0	[mrad]
4.49728	0.08317	0	0	1	-1.20456	[cm]
0	0	0	0	0	1	[%]
/[cm]	/[mrad]	/[cm]	/[mrad]	/[cm]	/[%]	



1 13 2014 13:06:47

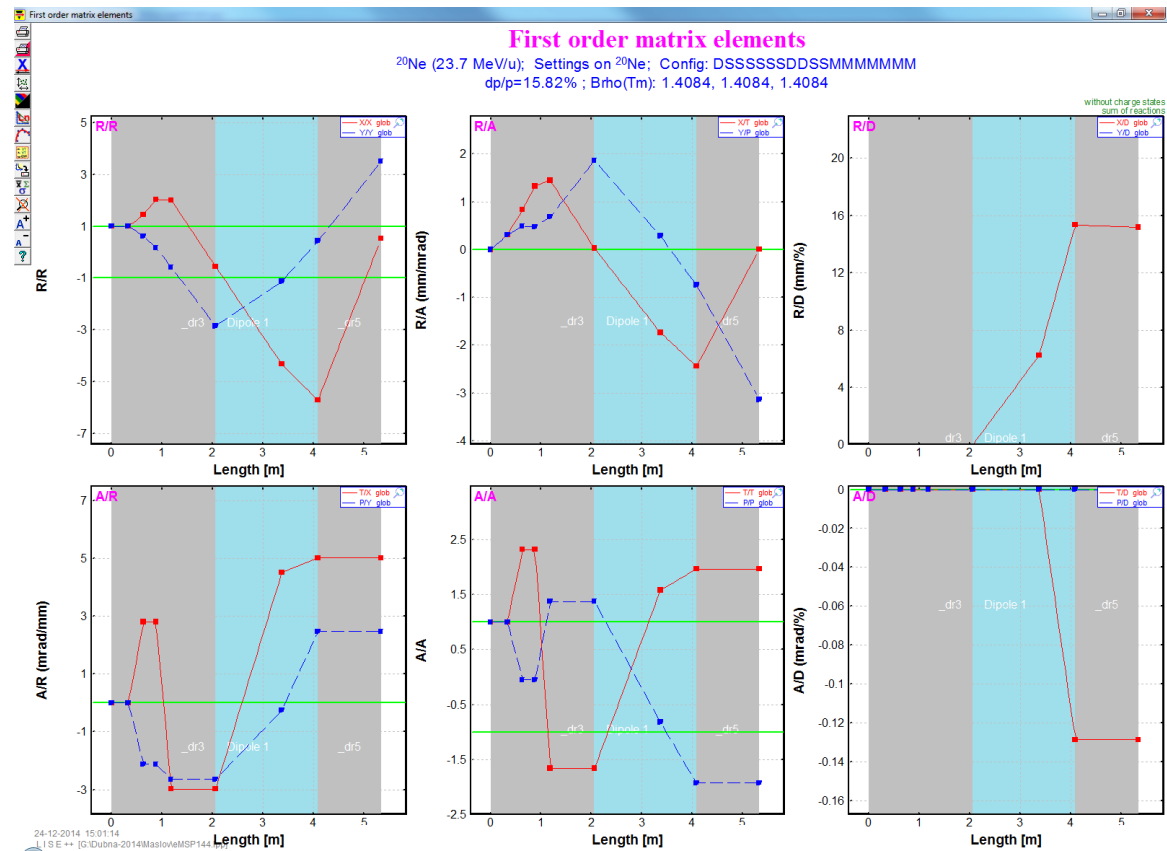
	effective	iron	delta	fileds	Quad-eff coef
drift	312.75	332			
quad1	338.5	300	19.25	-0.56	0.700
drift	211.5	250			
quad2	338.5	300	19.25	0.603	0.700
drift	858.75	878			
D1	g/2	2.35	cm		
D2	g/2	1.5	cm		
drift	1470				

Changed according to the original MSP144 information

Here is zero X-focus

LISE++

0.5166	-0.00016	0	0	0	1.51749	[cm]
49.51072	1.92071	0	0	0	-0.12865	[mrad]
0	0	3.51039	-0.31344	0	0	[cm]
0	0	24.68305	-1.91904	0	0	[mrad]
7.51983	0.29146	0	0	1	-1.20456	[cm]
0	0	0	0	0	1	[%]



24-12-2014 15:01:14
LISE++ [G:\Dubna-2014\Maslov\emMSP144

file
 “eMSP144_AngAcc.Ipp”

Beam

A Element q+
 20 Ne 10
 Z 10
 Stable

Table of Nuclides

Beam energy
 Energy 23.65378 MeV/u
 TKE 472.77 MeV
 Brho 1.4084 Tm
 P 4.222 GeV/c
 U 4.73e+4 KV

Beam intensity
 10 enA
 1 pnA
 6.25e+9 pps
 0.0004731 KW

Emittance
 Beam CARD (sigma, semi-axis, half-width)
 1D - shape (Distribution method)
 2D mode
 2D - shape (Monte Carlo method)
 Correlated with

mm cm
 beam respect to spectrometer
 dX 0 mm
 dT 0 mrad
 dY 0 mm
 dP 0 mrad
 dL 0 degrees
 dP 0 degrees

Energy Loss in the target box [KW] 0

RF frequency 20 MHz
 Bunch length 1 ns

Monte Carlo calculation of fragment transmission

What isotope transmission to calculate?
 One fragment of interest. Chose manually here
 Group of Isotopes already calculated by the Distribution method (Ncalc = 0)
 List of isotopes from file to produce inside target --no file--
 Input ions rays from file emitted from target --no file--

Chose fragment of interest

A Element Z
 20 Ne 10
 Stable

Table of Nuclides

Charge states
 10+ Dipole 1 Set

Reaction mechanism
 Projectile Fragmentation

MC transmission options

Velocity
 Velocity_Z [cm/ns]

Ion parameters (M,Z,q...)
 A [mass number]

X-coordinate After BLOCK
 Stripper as Y
 X mm
 X' (T) mrad
 Y mm
 Y' (P) mrad
 dP/P %
 Radial [f(X,Y)] mm
 Angle [f(X',Y')] mrad
 Energy MeV/u
 TKE MeV
 Momentum MeV/c
 Brho T*m
 Erho MJ/C
 Energy Loss MeV
 Range mm
 Envelope m
 Energy Deposition MeV/mm /particle
 Time of flight ns
 Length m

Y-coordinate After BLOCK
 Stripper as X
 X mm
 X' (T) mrad
 Y mm
 Y' (P) mrad
 dP/P %
 Radial [f(X,Y)] mm
 Angle [f(X',Y')] mrad
 Energy MeV/u
 TKE MeV
 Momentum MeV/c
 Brho T*m
 Erho MJ/C
 Energy Loss MeV
 Range mm
 Envelope m
 Energy Deposition MeV/mm /particle
 Time of flight ns
 Length m

Gate 1
 Settings
 "AND" [-100, 100]
 <X [mm]> after frame

Gate 2
 no gate

Gate 3
 no gate

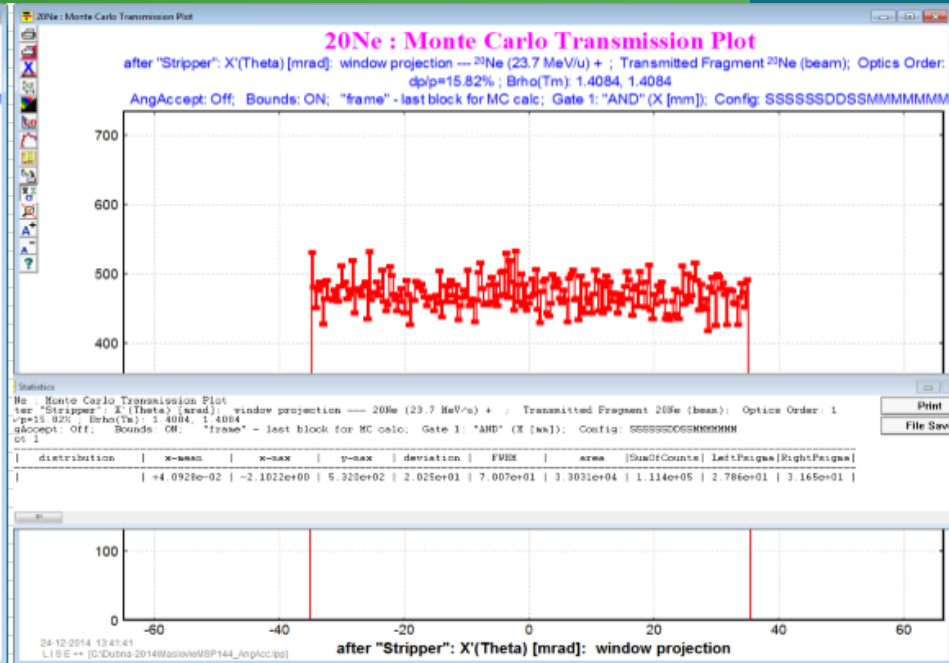
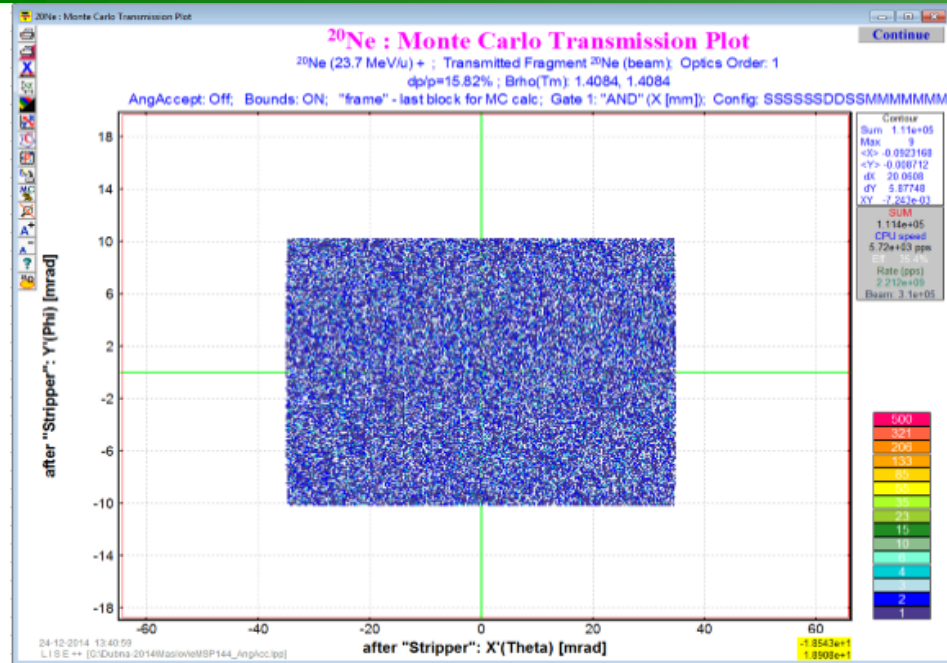
Gate 4
 no gate

Stripper << Start >> Stripper
 Window << Stop >> Window

Velocity
 Velocity [cm/ns]

Ion parameters (M,Z,q...)
 Z-q

Quit



Global Transmission

Component	Transmission
Target	100.0%
dr1	100.0%
Quad1	100.0%
dr2	82.04%
Inside of bounds	82.04%
Quad2	84.10%
Inside of bounds	84.10%
dr3	100.0%
dr3a	100.0%
Dipole 1	65.97%
Inside of bounds	65.97%
Dipole 2	100.0%
dr5	100.0%
frame	77.48%
Slits	77.48%

CUTS

ANGULAR ACCEPTANCE

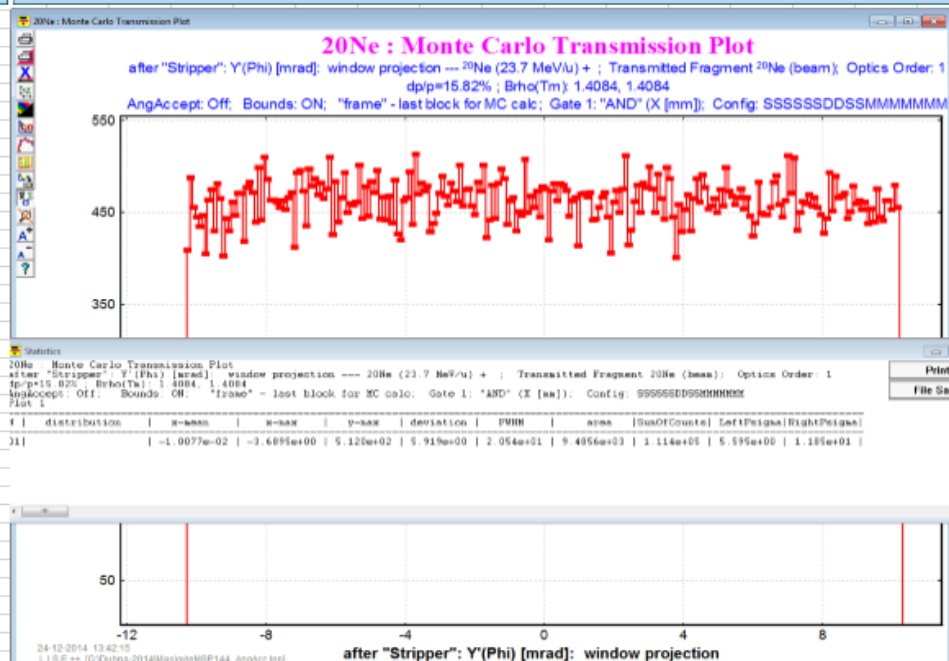
Shape: Rectangle Ellipse

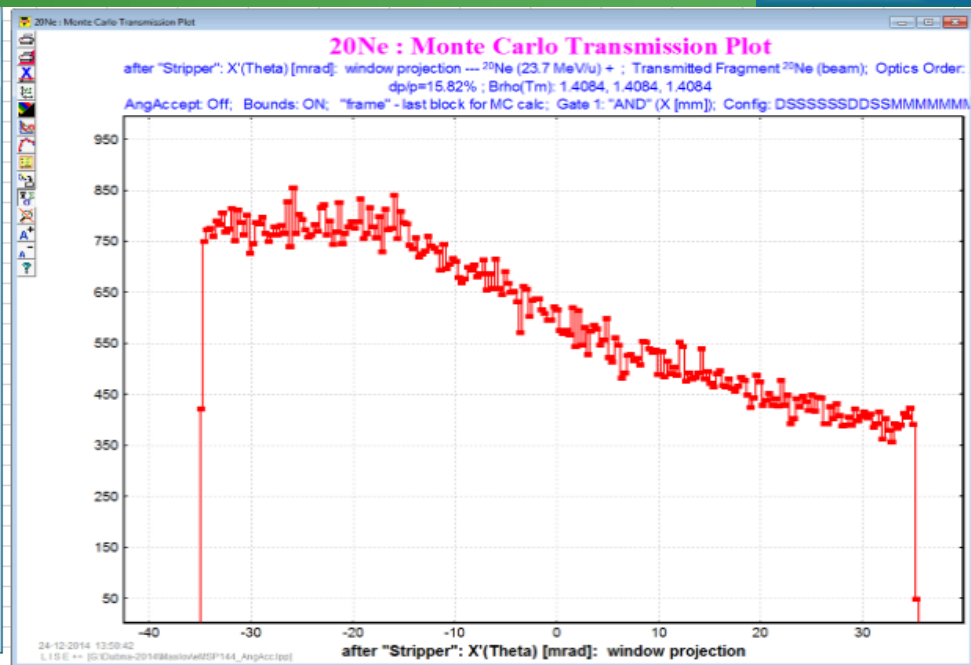
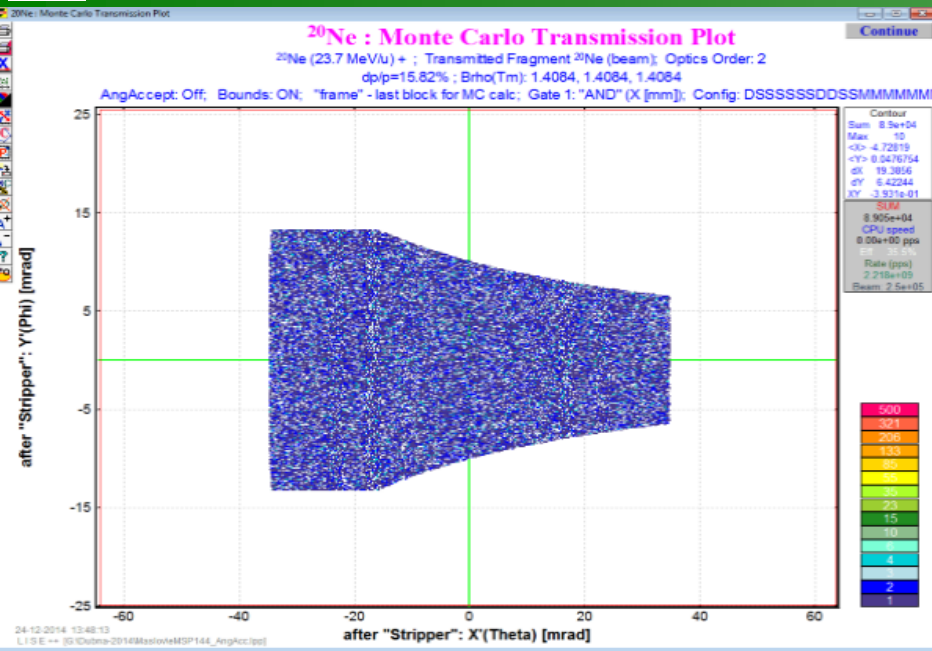
mrad <-> deg

Horizontal ± 35 mrad

Vertical ± 10.3 mrad

Solid angle 1.13 msr





Global Transmission	CUTS
Target	
tuning	100.0%
_dr1	100.0%
Quad1	100.0%
dr2	82.29%
Inside of bounds	82.29%
quad2	83.95%
Inside of bounds	83.95%
_dr3	100.0%
_dr3a	100.0%
Dipole 1	66.55%
Inside of bounds	66.55%
Dipole 2	98.70%
Slits	98.70%
dr5	98.66%
Inside of bounds	98.66%
frame	79.58%
Slits	79.58%
Filter-gate 1	100.0%

RECOMMENDED

ANGULAR ACCEPTANCE

Shape

Rectangle ?

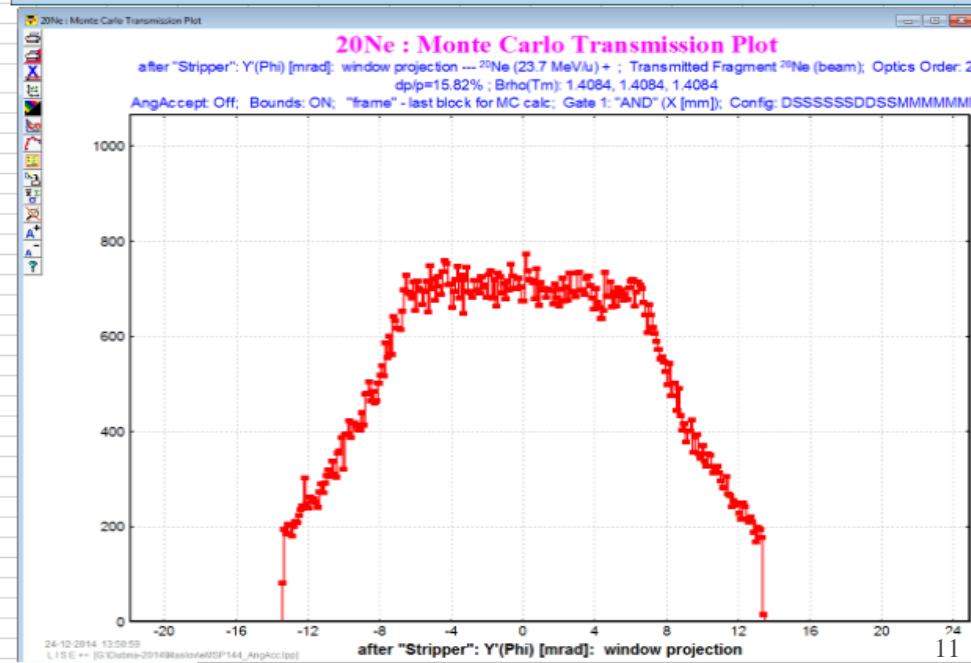
Ellipse

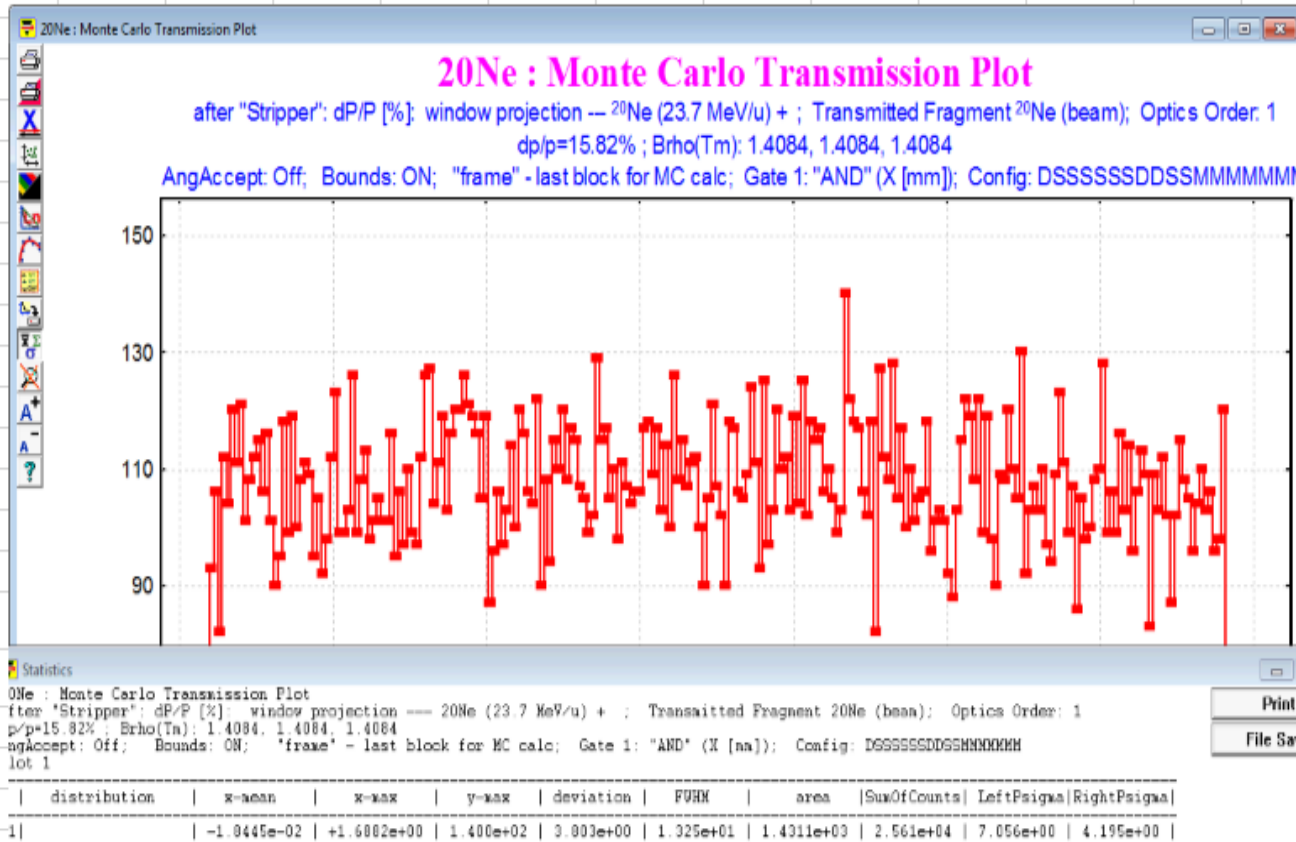
mrad <-> deg

Horizontal ± 35 mrad

Vertical ± 9 mrad

Solid angle 0.99 msr



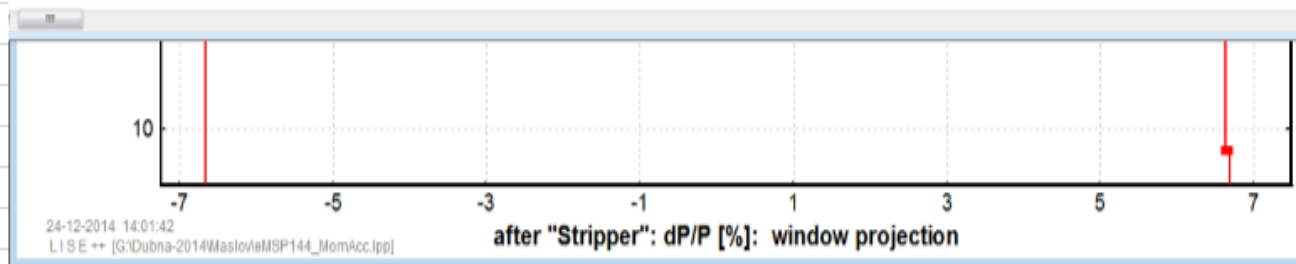


Emittance

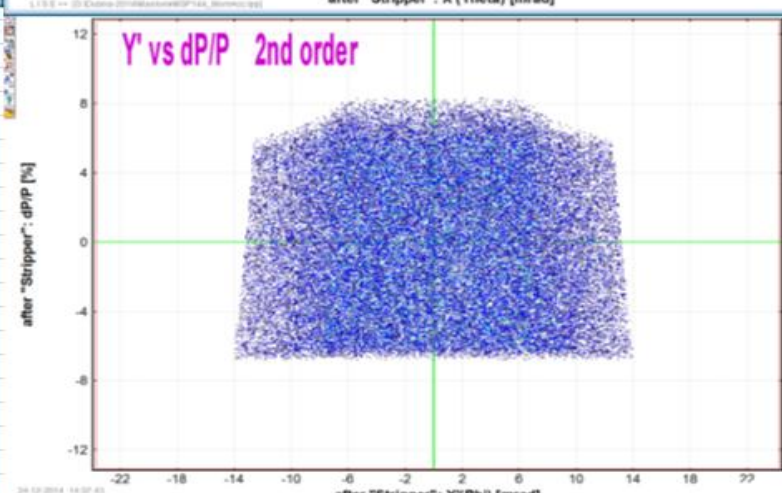
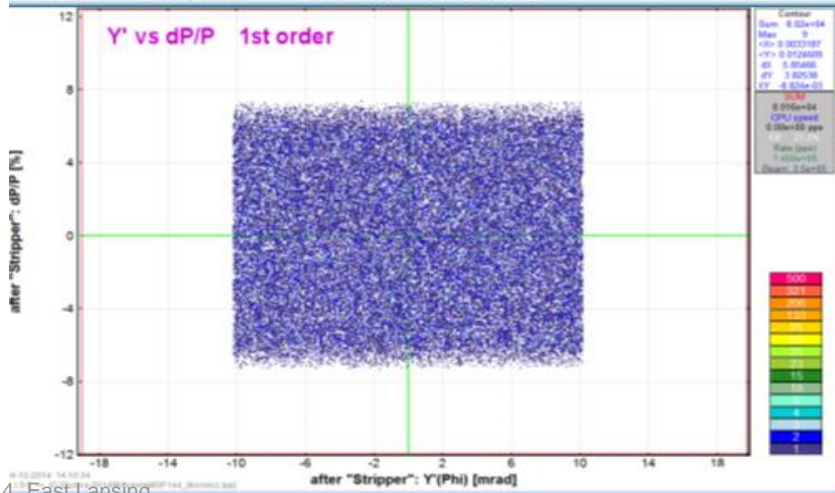
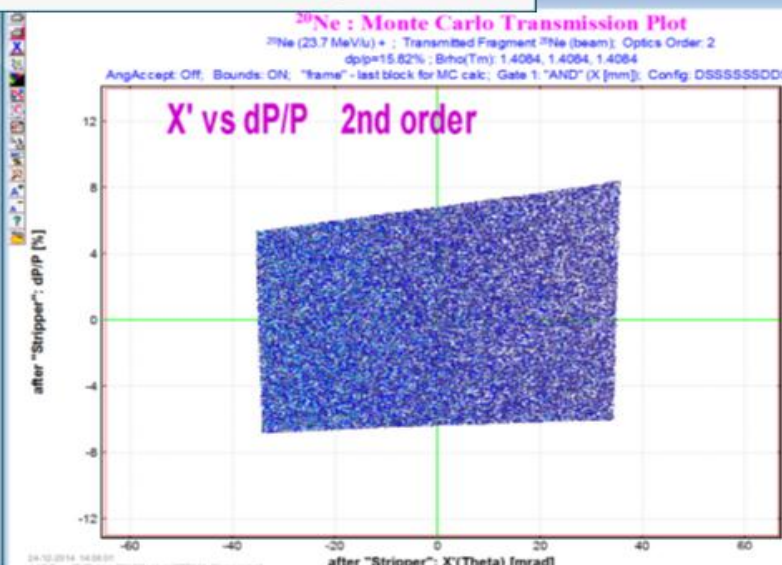
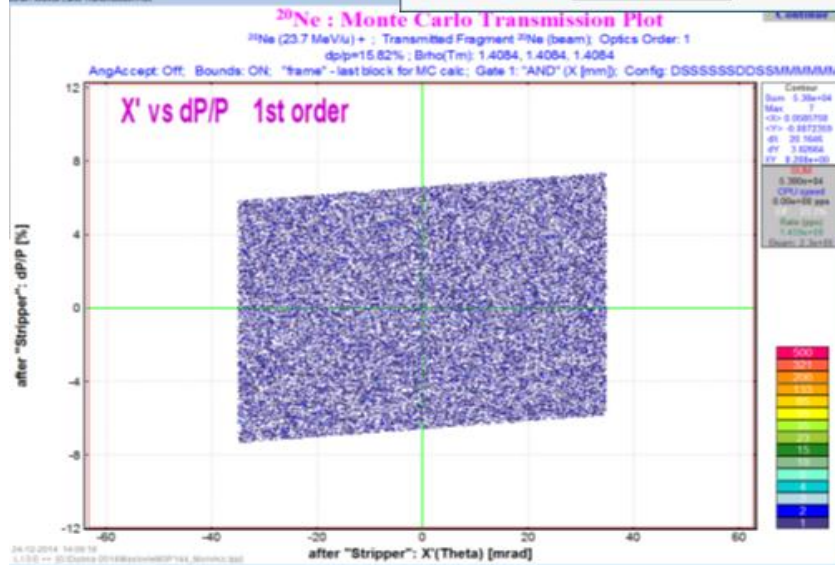
	Beam CARD (sigma, semi-axis, half-width...)	1D - shape (Distribution method)
1. X mm	0	Gaussian
2. T mrad	0	Rectangle uniform
3. Y mm	0	Gaussian
4. P mrad	0	Rectangle uniform
5. L mm	0	Gaussian
6. D %	20	Gaussian

in the current configuration is defined by the Ionization chamber size

$dP/P = 13.25 \% \text{ (total)}$



A Element: 10 File: 10 Z: 10 Stable Table of Nuclides Z: [] N: [] Ok Cancel		Beam energy: Energy: 23.65370 MeV/u TKE: 472.77 MeV Rho: 1.4084 Tm P: 4.222 GeV/c U: 4.73e4 KV Beam intensity: <input type="radio"/> 10 enA <input checked="" type="radio"/> 1 pnC <input type="radio"/> 5.25e9 pps <input type="radio"/> 0.0004731 kW	Emission ? Beam CARD (karma, semi-adj.) 1D - shape (Distribution) 2D mode 2D - shape (Monte Carlo method) Correlated with mm (r) cm beam respect to spectrometer dX: 0 mm dY: 0 mm dZ: 0 mm dT: 0 degrees dP: 0 degrees Energy Loss in the target box [KW]: 0 RF frequency: 20 MHz Bunch length: 1 ns
		1. X mm: 0 Gaussian 2. T mrad: 50 Rectangle uniform 3. Y mm: 0 Gaussian 4. P mrad: 20 Rectangle uniform 5. L mm: 0 Gaussian 6. D %: 10 Rectangle uniform	



“eMSP144_a.lpp”

Beam

A: 20, Element: Ne, q+: 10

Z: 10, Stable

Table of Nuclides

Beam energy: Energy: 23.65378 MeV/u, TKE: 472.77 MeV, Brho: 1.4084 Tm, P: 4.222 GeV/c, U: 4.73e+4 KV

Beam intensity: 10 enA, 1 pnA

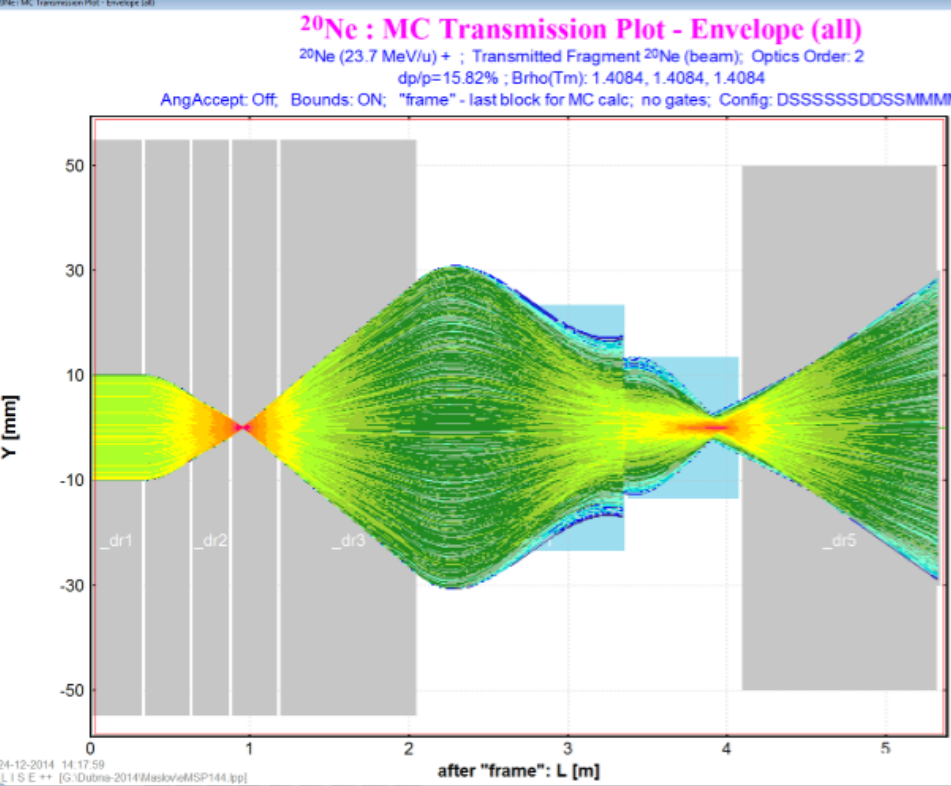
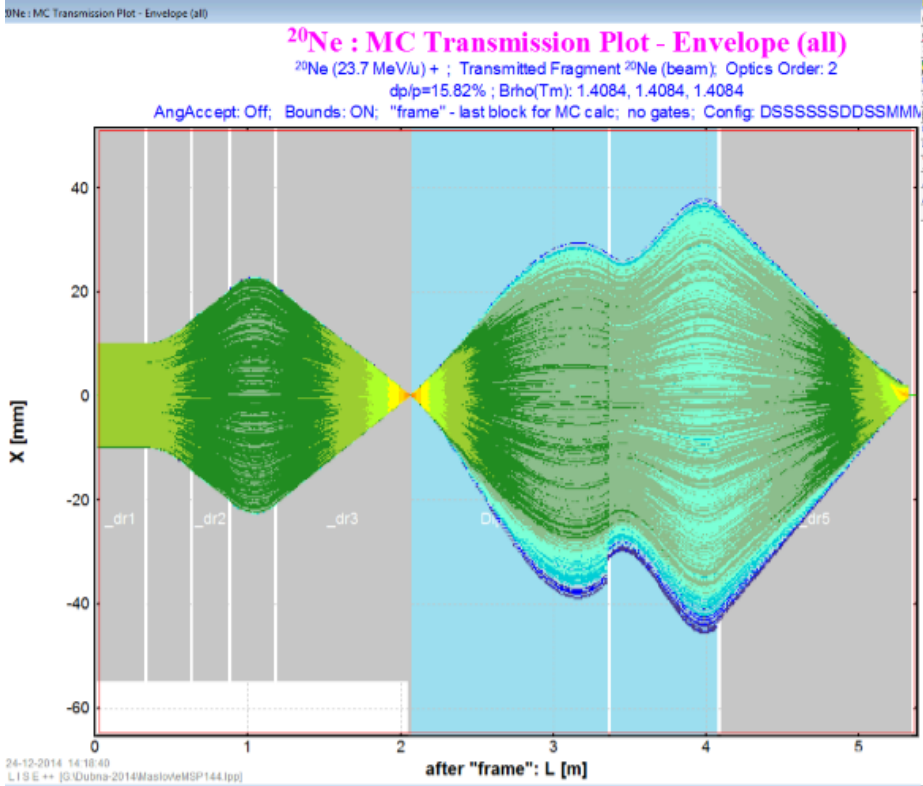
Emittance

Beam CARD (sigma, semi-axis, half-width...)	1D - shape (Distribution method)	2D mode	2D - shape (Monte Carlo method)	Correlated with
1. X mm 10	Rectangle uniform	<input type="checkbox"/>		
2. T mrad 0	Gaussian	<input type="checkbox"/>		
3. Y mm 10	Rectangle uniform	<input type="checkbox"/>		
4. P mrad 0	Gaussian	<input type="checkbox"/>		
5. L mm 0	Gaussian	<input type="checkbox"/>		
6. D % 0	Gaussian	<input type="checkbox"/>		

mm cm

beam respect to spectrometer

dX: 0 mm, dT: 0 mrad, dY: 0 mm, dP: 0 mrad, dT: 0 degrees, dP: 0 degrees



“eMSP144_a.lpp”

Beam

A	Element	q+
20	Ne	10
	Z	
	10	
Stable		
Table of Nuclides		
	Z	
	N	

Beam energy

Energy	23.65378	MeV/u
TKE	472.77	MeV
Brho	1.4084	Tm
P	4.222	GeV/c
U	4.73e+4	KV

Beam intensity

	10	enA
	1	pnA

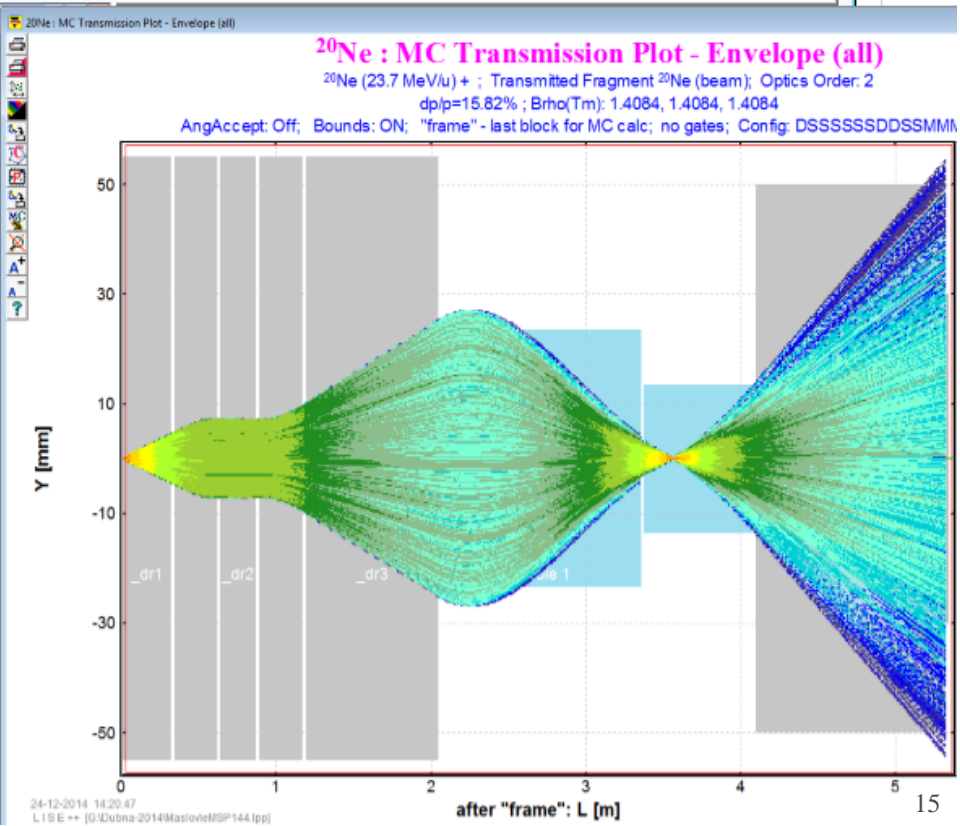
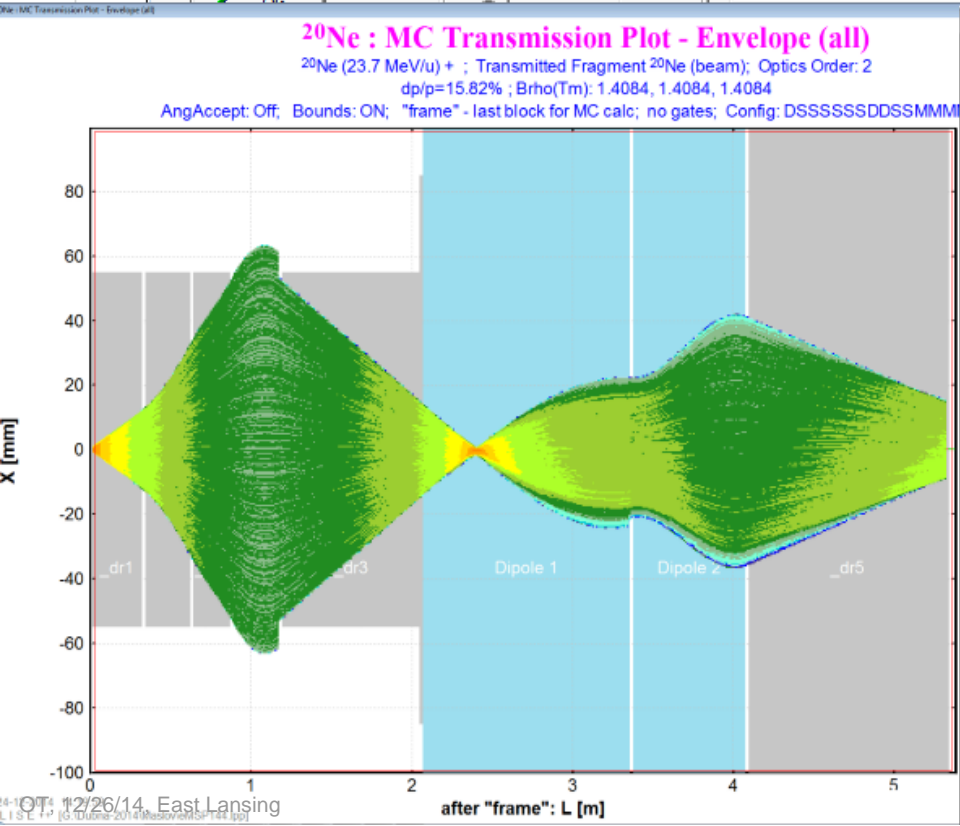
Emittance

	Beam CARD (sigma, semi-axis, half-width...)	1D - shape (Distribution method)	2D mode	2D - shape (Monte Carlo method)	Correlated with
1. X	mm 0	Rectangle uniform	<input type="checkbox"/>		
2. T	mmrad 40	Rectangle uniform	<input type="checkbox"/>		
3. Y	mm 0	Rectangle uniform	<input type="checkbox"/>		
4. P	mmrad 15	Rectangle uniform	<input type="checkbox"/>		
5. L	mm 0	Gaussian	<input type="checkbox"/>		
6. D	% 0	Gaussian	<input type="checkbox"/>		

mm cm

beam respect to spectrometer

dX	0	mm
dT	0	mmrad
dY	0	mm
dP	0	mmrad
dT	0	degrees
dP	0	degrees



“eMSP144_a.lpp”

Beam

A	Element	q+
20	Ne	10
	10	
	Z	

Stable

Table of Nuclides

Beam energy

Energy	23.65378	MeV/u
TKE	472.77	MeV
Brho	1.4084	Tm
P	4.222	GeV/c
U	4.73e+4	KV

Beam intensity

	10	enA
	1	pnA
	6.25e+9	pps

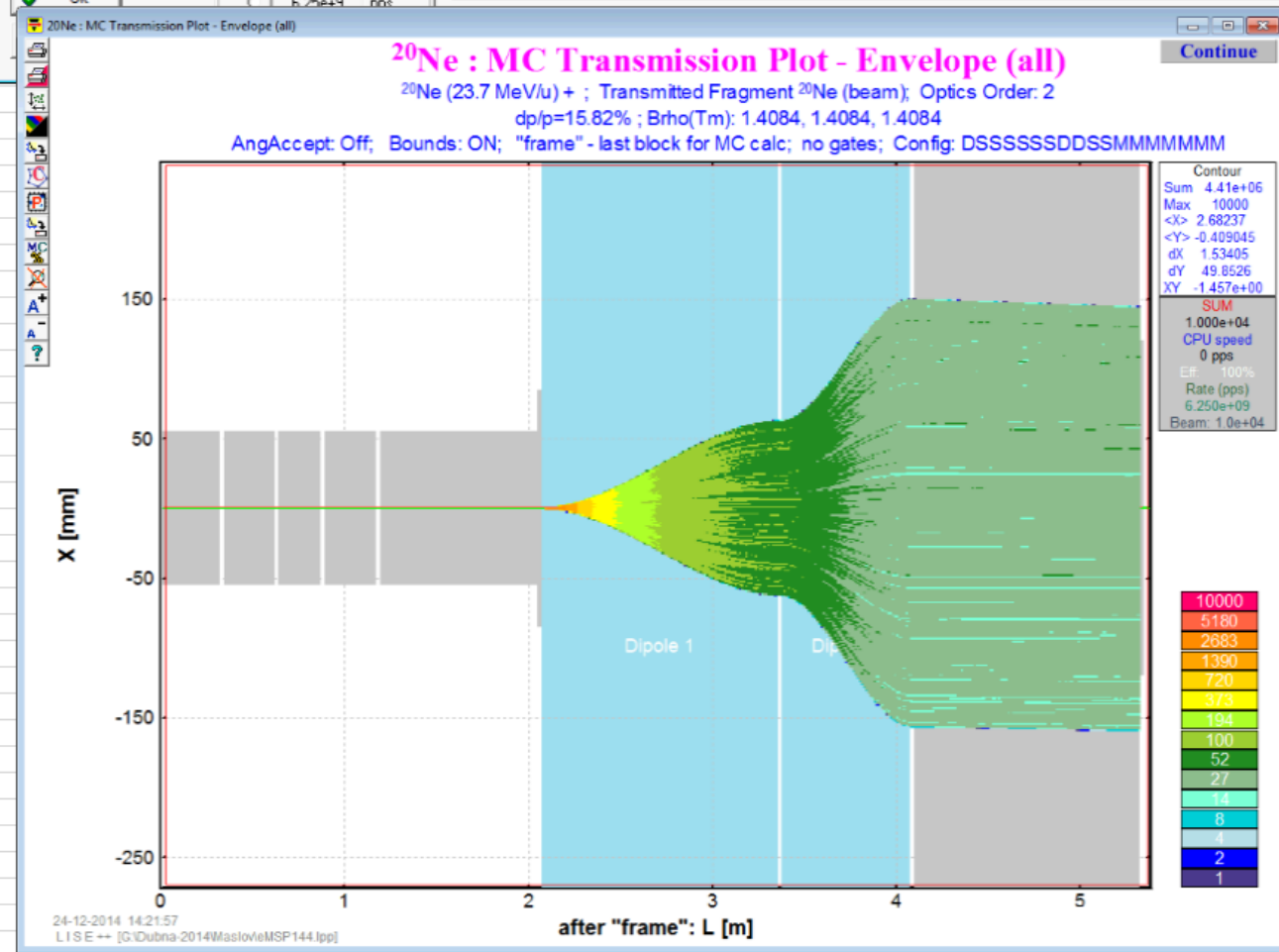
Emittance

Beam CARD (sigma, semi-axis, half-width...)	1D - shape (Distribution method)	2D mode	2D - shape (Monte Carlo method)	Correlated with
1. X mm	0 Rectangle uniform	<input type="checkbox"/>		
2. T mrad	0 Rectangle uniform	<input type="checkbox"/>		
3. Y mm	0 Rectangle uniform	<input type="checkbox"/>		
4. P mrad	0 Rectangle uniform	<input type="checkbox"/>		
5. L mm	0 Gaussian	<input type="checkbox"/>		
6. D %	10 Rectangle uniform	<input type="checkbox"/>		

beam respect to spectrometer

dX	0	mm
dT	0	mrad
dY	0	mm
dP	0	mrad
dT	0	degrees
dP	0	degrees

Ok



Beam

A	Element	q+	Beam energy	Emittance	Correlated with
20	Ne	10	Energy <input checked="" type="radio"/> 23.65378 MeV/u	Beam CARD (sigma, semi-axis, half-width...)	
		10	TKE <input type="radio"/> 472.77 MeV	1D - shape (Distribution method)	
		Z	Brho <input type="radio"/> 1.4084 Tm	2D mode	
Stable			P <input type="radio"/> 4.222 GeV/c	2D - shape (Monte Carlo method)	
Table of Nuclides			U <input type="radio"/> 4.73e+4 KV		
← Z →			Beam intensity		
← N →			<input type="radio"/> 10 enA		
			<input checked="" type="radio"/> 1 pnA		
			<input type="radio"/> 6.25e+9 pps		
			<input type="radio"/> 0.0004731 KW		
Ok			Energy Loss in the target box [KW]		
Cancel			0		

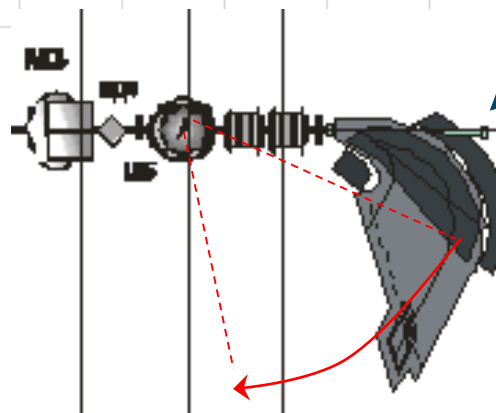
1. X mm	5	Gaussian	<input type="checkbox"/>
2. T mrad	8	Gaussian	<input type="checkbox"/>
3. Y mm	5	Gaussian	<input type="checkbox"/>
4. P mrad	8	Gaussian	<input type="checkbox"/>
5. L mm	0	Gaussian	<input type="checkbox"/>
6. D %	0.2	Gaussian	<input type="checkbox"/>

mm <input checked="" type="radio"/> cm <input type="radio"/>	
beam respect to spectrometer	
dX	0 mm
dT	0 mrad
dY	0 mm
dP	0 mrad
dT	0 degrees
dP	0 degrees

RF frequency	20 MHz
Bunch length	1 ns

параметры пучка продуктов реакции.

1. Диаметр пучка — 10 мм.
2. Эмиттанс пучка — $\epsilon_x = \epsilon_y = 40 - 60 \pi$ мм мрад.



use this cell to "turn" separator relatively the primary beam