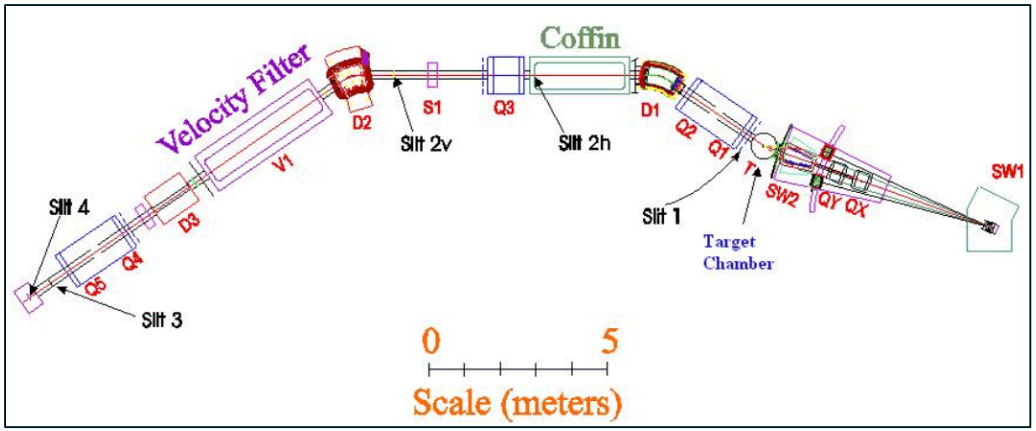
Compensating dipole; MARS spectrometer

v.9.8.41
from 03/15/14



1. **Compensating dipole**
2. **Using Quadrupole calibration files**
3. **TAMU extended configurations**
4. **MARS Angular and momentum acceptances**
5. **“Solenoid” configuration**

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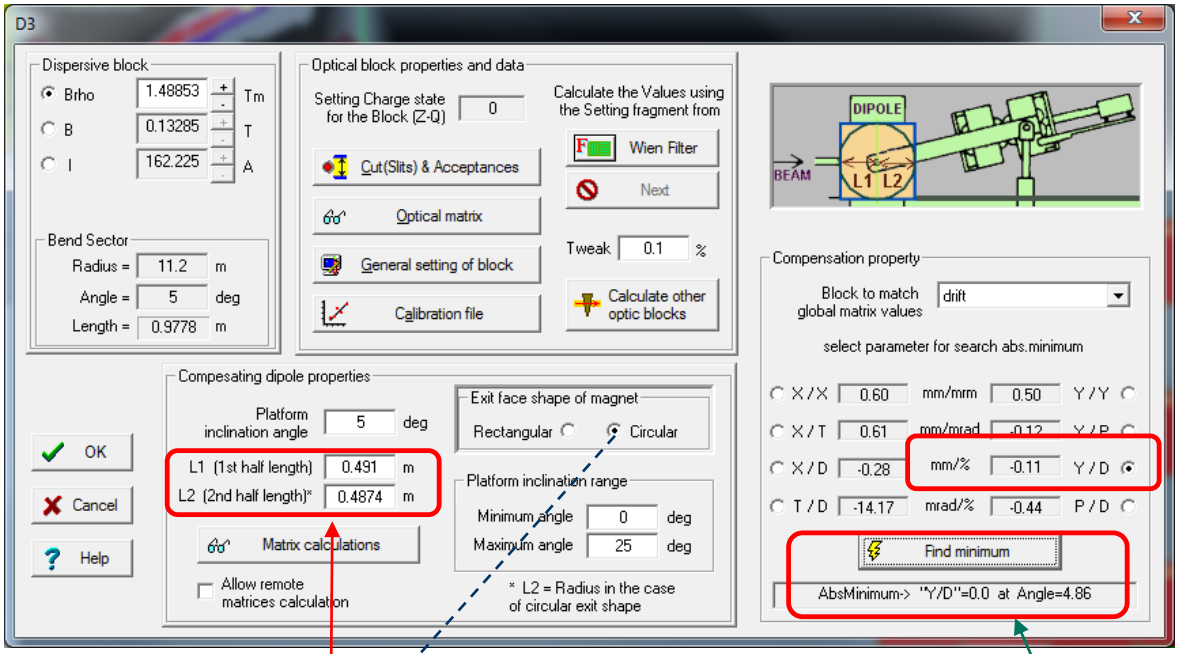
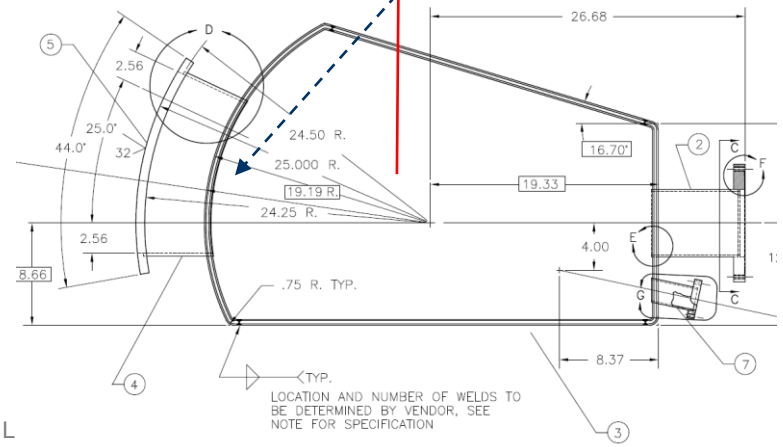
v.9.8.177
from 12/28/14
update

The presentation has been updated (12/28/2014) to order to include the MARS separator, Solenoid setup and Compensating dipole updates

Compensating dipole

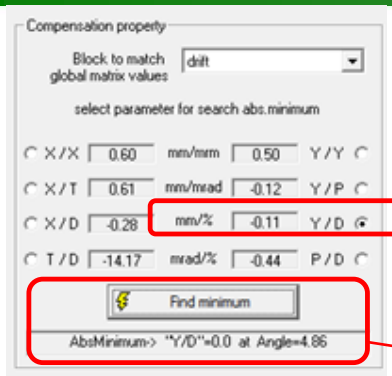
The Compensating dipole can own only "E-block" property.
The matrices (up to second order) are calculated by the code based on its geometry (L1,L2,Platform inclination angle, Y-gap).

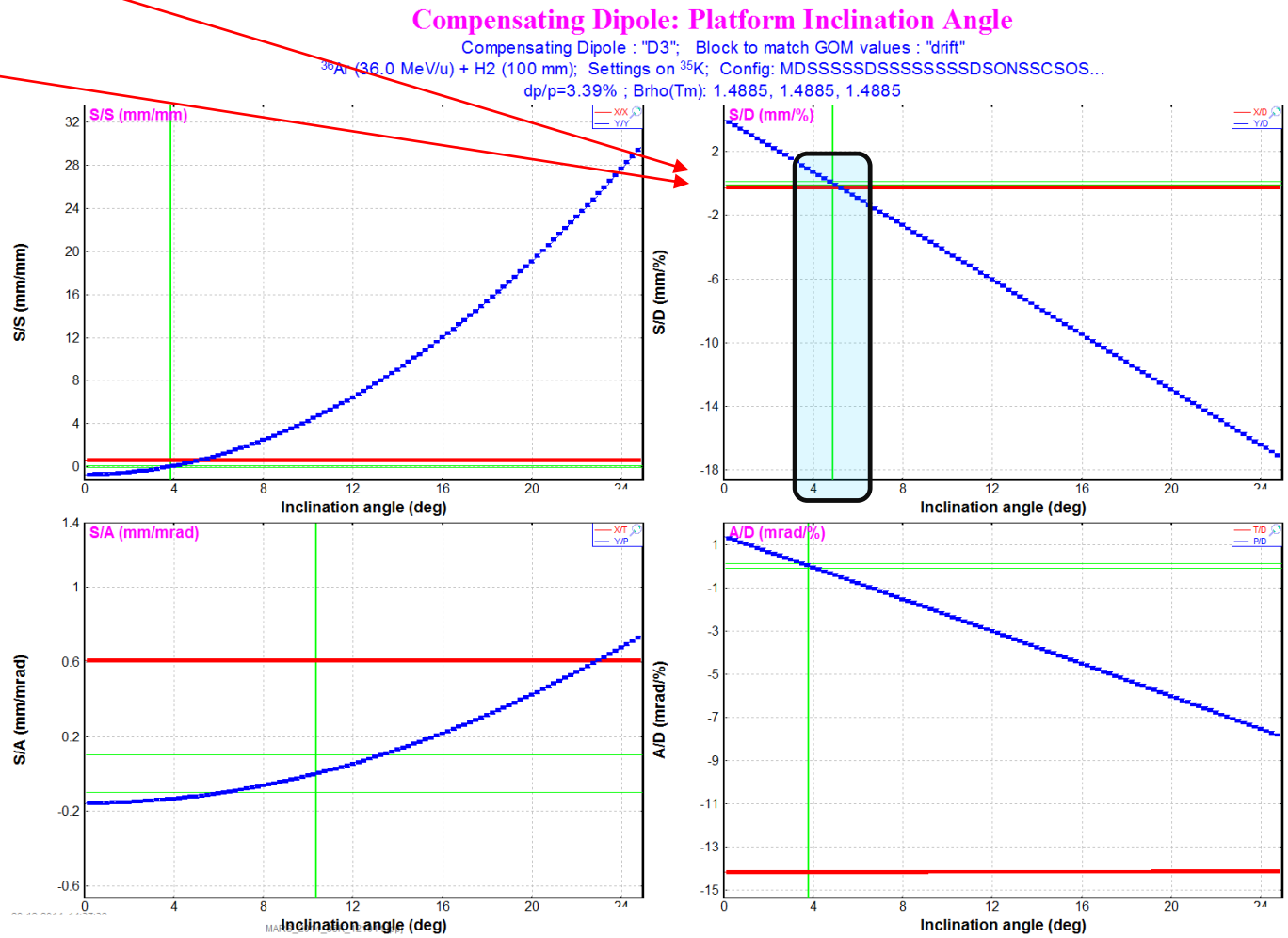




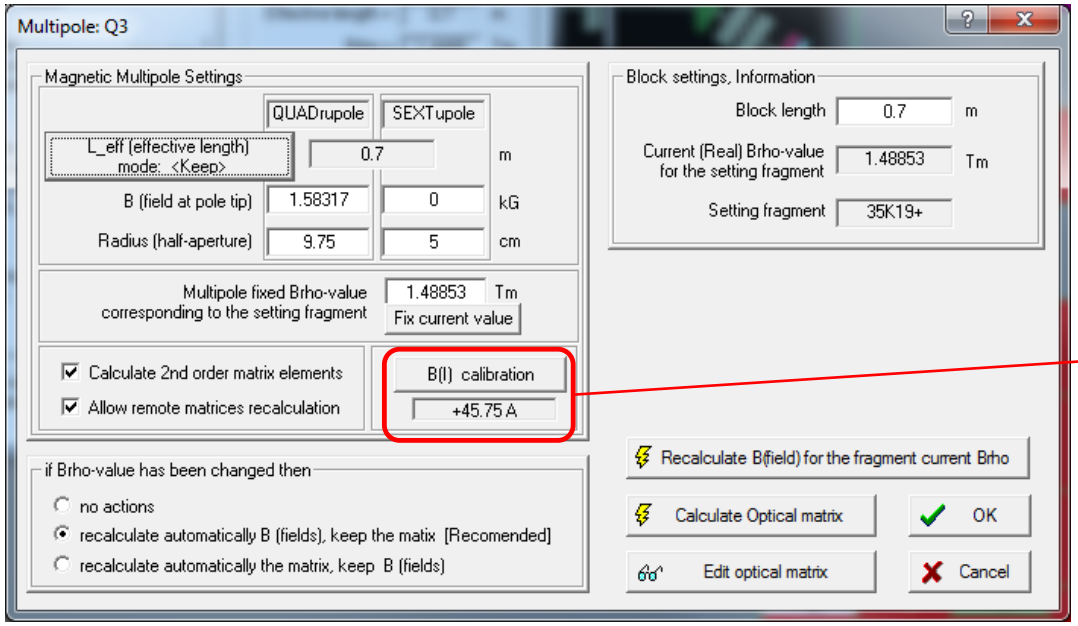
calculation of platform inclination angle

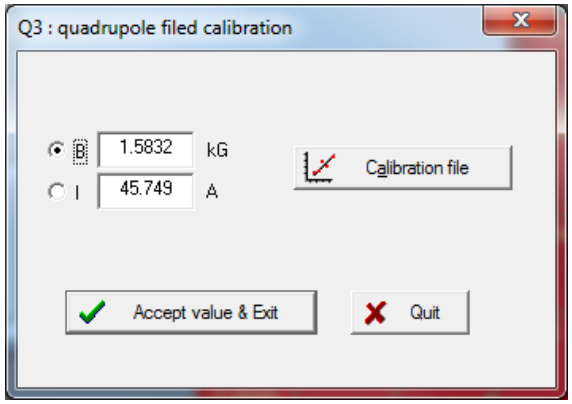
Compensating dipole : calculation of platform inclination angle





Using Quadrupole calibration files





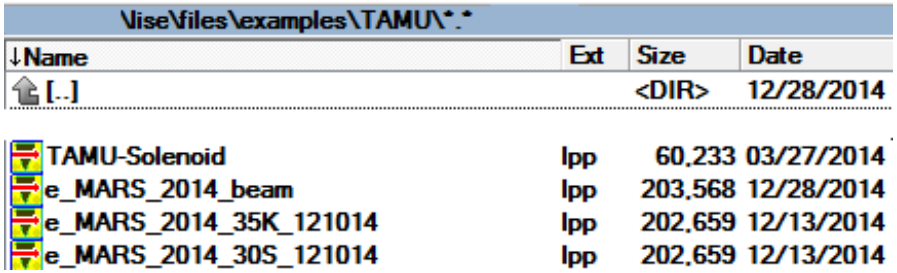
MARS quad and dipole calibration files

\lise\calibrations\TAMU*.*

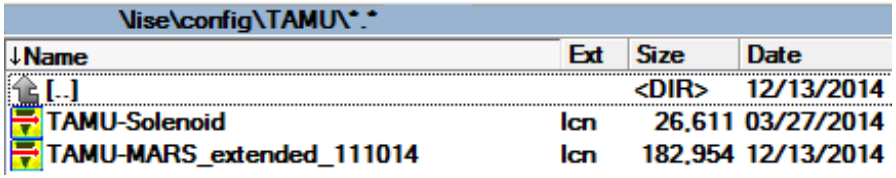
Name	↑Ext	Size	Date
[..]		<DIR>	12/12/2014
MARS_D12	cal	347	03/14/2014
MARS_D3	cal	236	03/14/2014
MARS_D3_2014_08	cal	266	12/13/2014
MARS_Q1	cal	346	03/14/2014
MARS_Q2	cal	237	03/14/2014
MARS_Q3	cal	167	03/14/2014
MARS_Q4_2014_08	cal	217	12/13/2014
MARS_Q45	cal	158	03/14/2014
MARS_Q5_2014_08	cal	223	12/13/2014

TAMU extended configurations

TAMU extended files in the LISE++ package



TAMU extended configurations in the LISE++ package

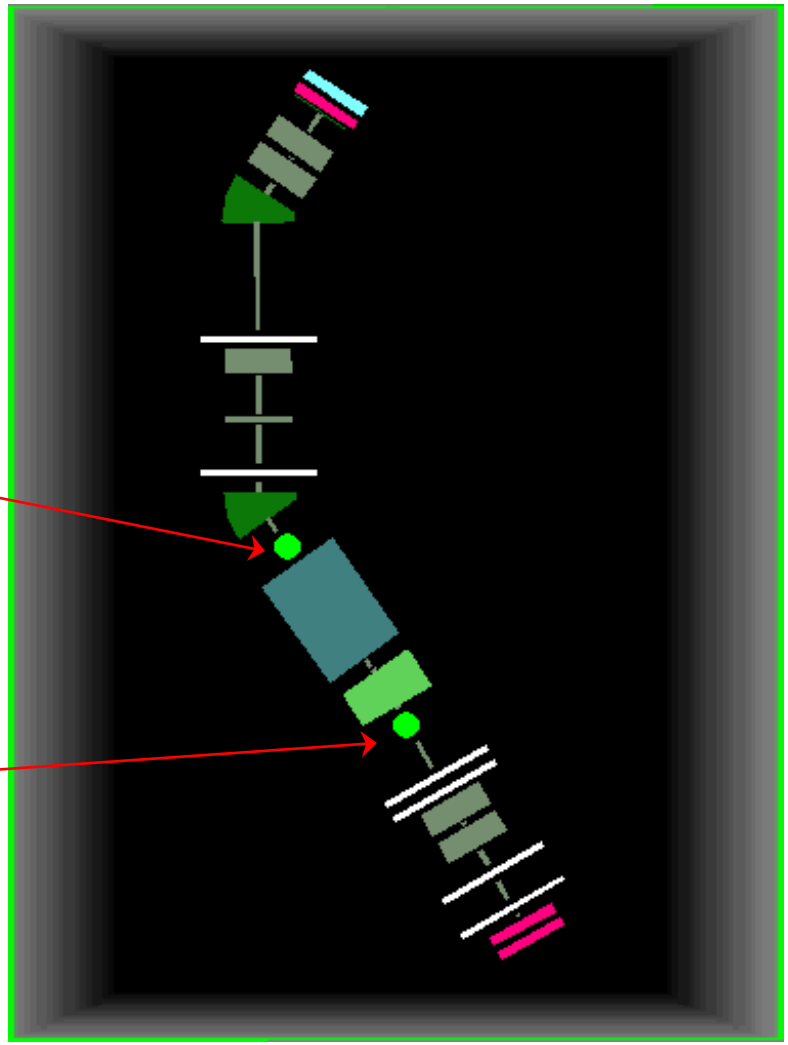


Note: There are an extended configurations!
For details on extended configuration approach please use the next links

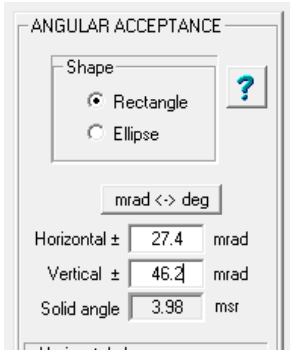
Configurations
Angular acceptance

MARS separator configuration : rotations

Q	Q3	QUAD 1.5832 kG
S	drift	standard 1.09 m
Q	sextupole 1	m-dr 20 cm
S	drift	standard 1.07 m
S	Vert. Slit Box	slits
S	drift	standard 31.75 cm
D	D2	Brho 1.4885 Tm
S	drift	standard 50 cm
R	Rotate 1	Angle -90 deg
F	Wien Filter	E 2560 KV/m B 339.07 G DL -1.04 mm/%
S	Drift	standard 30 cm
S	Dipole chamber	standard 18.67 cm
C	D3	Br 1.4885 Tm Angle 5 deg
S	Dipole chamber	standard 14.76 cm
R	Rotate 2	Angle 90 deg
S	drift	standard 88 cm
S	sextupole 2	slits
S	drift	slits
Q	Q4	QUAD -1.7263 kG
S	drift	standard 14 cm
Q	Q5	QUAD 2.8368 kG
S	drift	standard

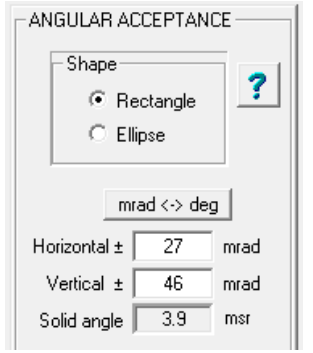


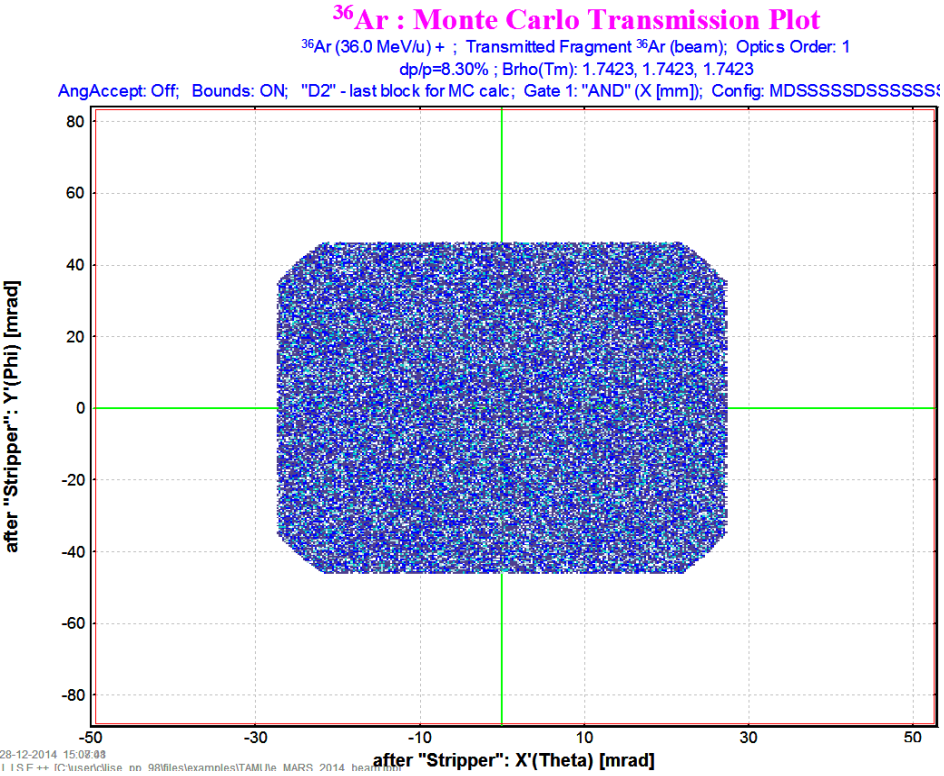
MARS separator : Angular Acceptance of the Target-D2 part

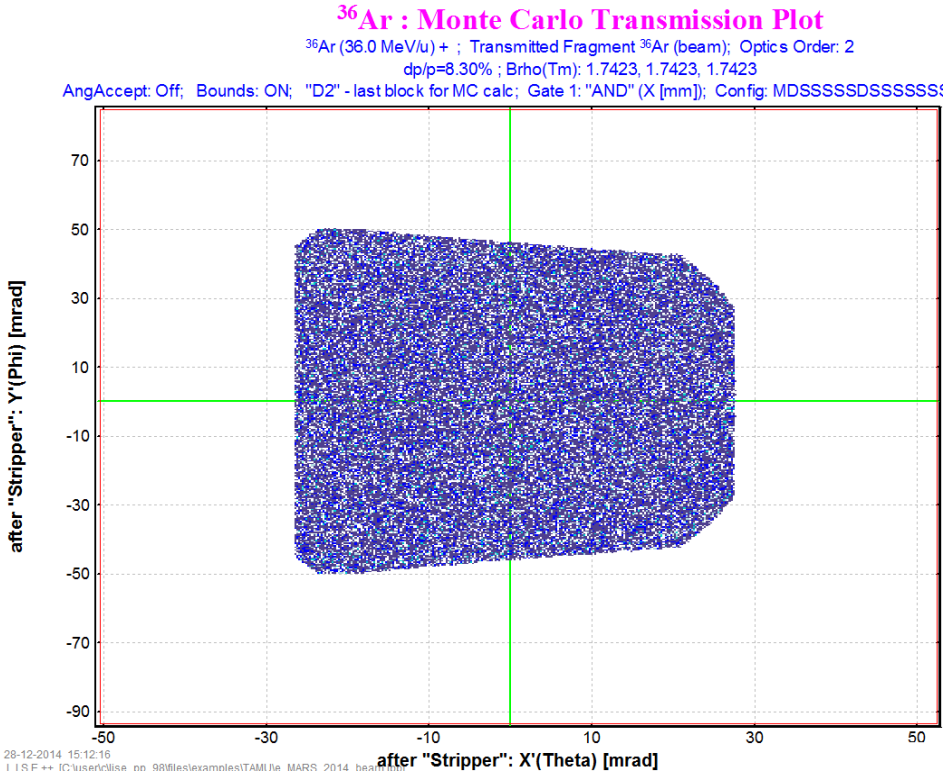


1st order

2nd order

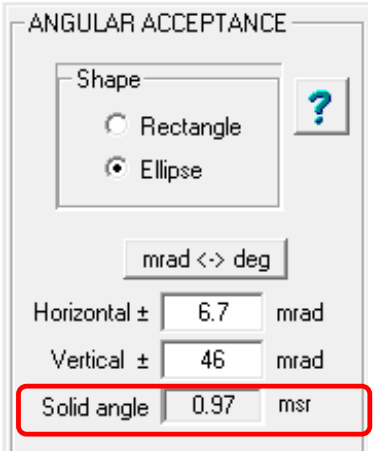


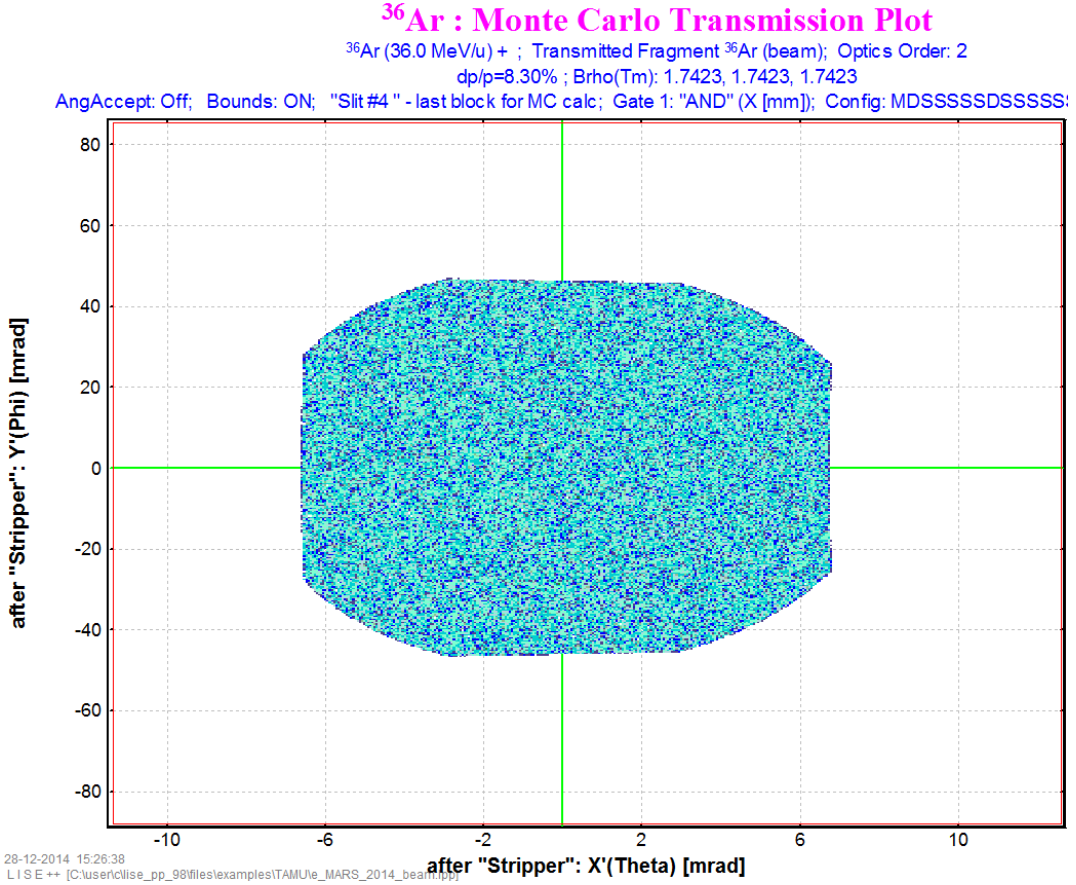




Ellipse shape!

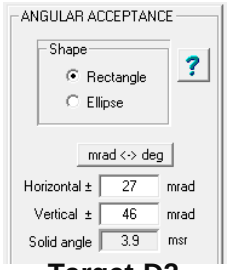
2nd order



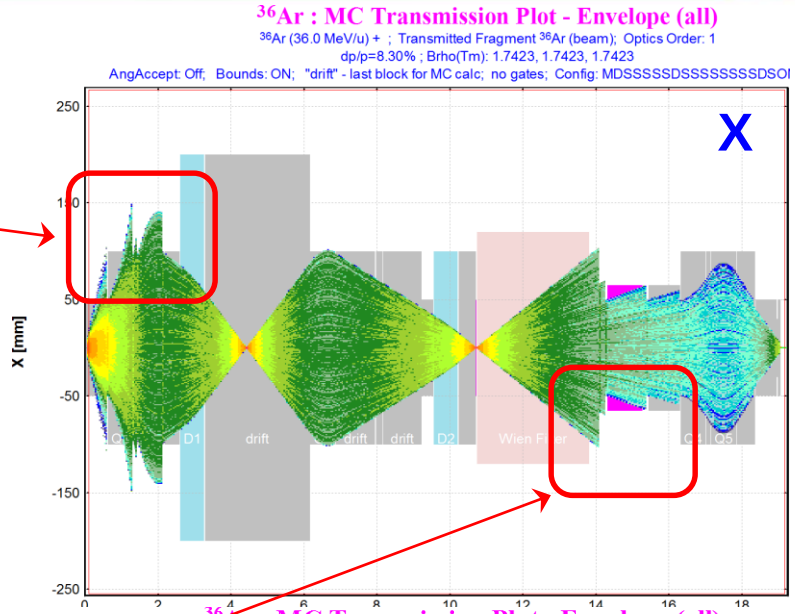


Angular Acceptance : cuts

drift	100.0%
Q1	94.55%
Inside of bounds	94.55%
drift	80.96%
Inside of bounds	80.96%
Q2	71.75%
Inside of bounds	71.75%
drift	100.0%
D1	100.0%

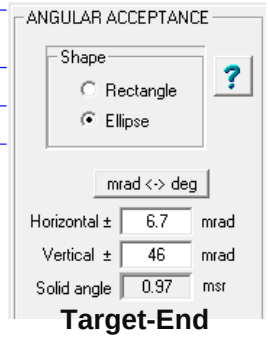


Target-D2

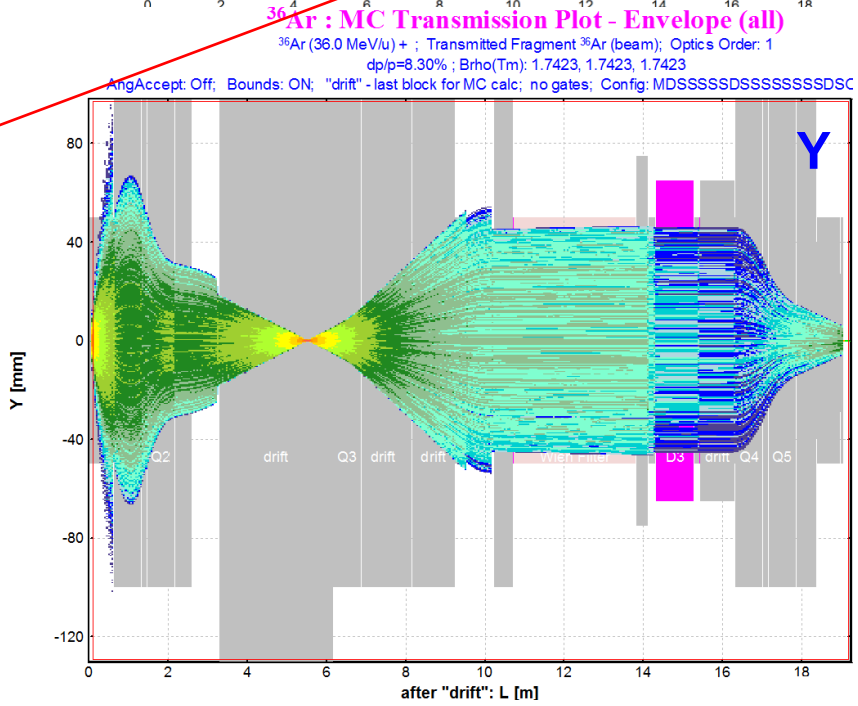


Main angular acceptance cut takes place in the X-plane after the Wien-filter

Wien Filter	100.0%
Drift	66.06%
Inside of bounds	66.06%
Dipole chamber	58.19%
Inside of bounds	58.19%
D3	100.0%
Dipole chamber	76.09%
Inside of bounds	76.09%
Rotate 2	100.0%
drift	100.0%
sextupole 2	85.01%
Inside of bounds	85.01%



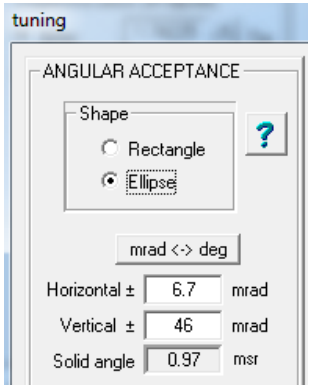
Target-End

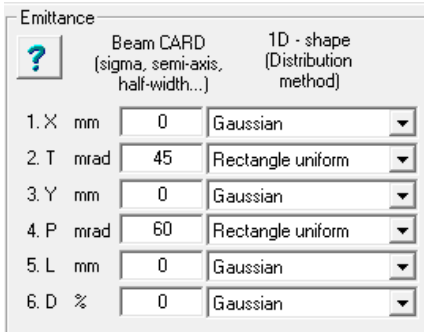


Angular Acceptance : Different methods

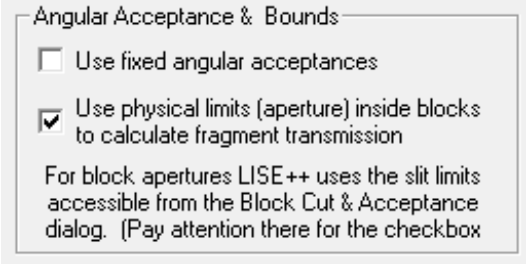
File: e_MARS_2014_beam.lpp

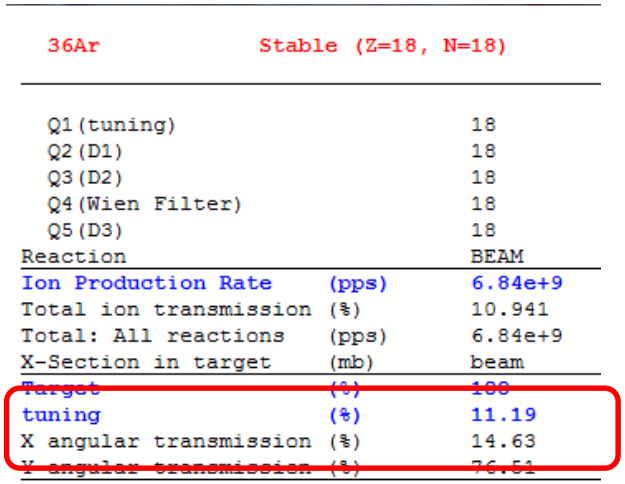
"Distribution" (analytical) method



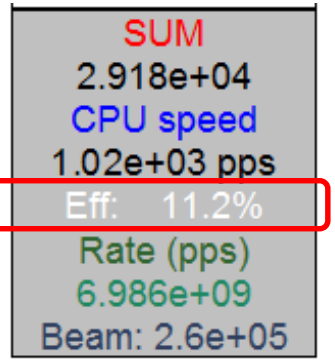


"Monte Carlo" method





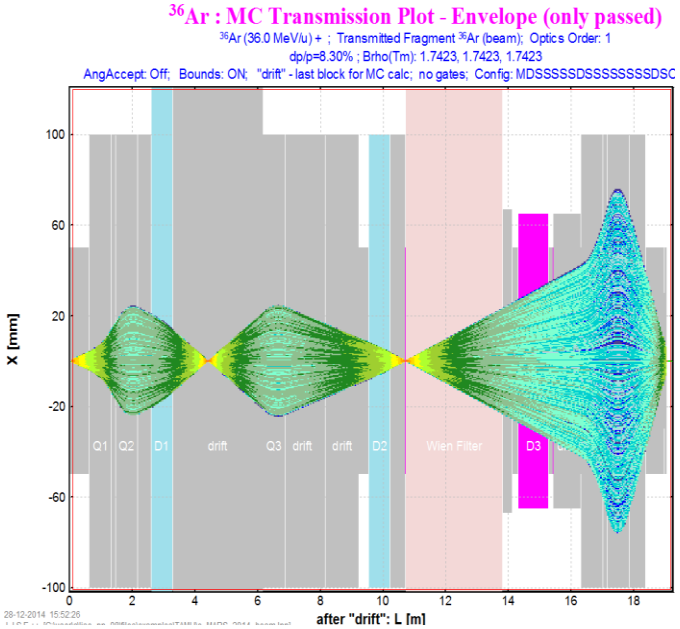
1st order



X-envelopes

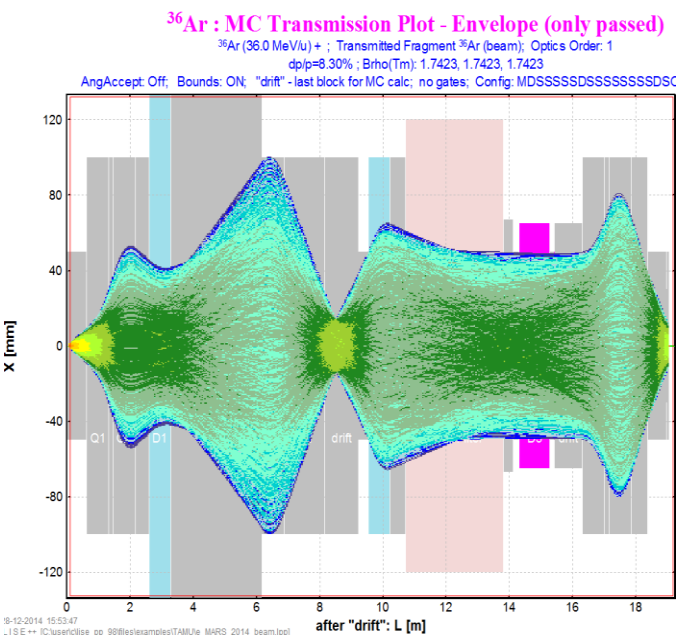
Emittance

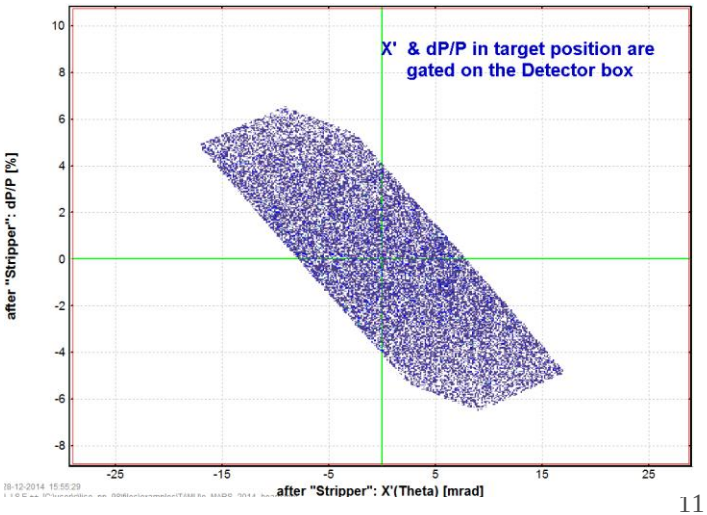
		Beam CARD (sigma, semi-axis, half-width...)	1D - shape (Distribution method)
1. X	mm	0	Gaussian
2. T	mrad	45	Rectangle uniform
3. Y	mm	0	Gaussian
4. P	mrad	0	Rectangle uniform
5. L	mm	0	Gaussian
6. D	%	0	Gaussian



Emittance

		Beam CARD (sigma, semi-axis, half-width...)	1D - shape (Distribution method)
1. X	mm	0	Gaussian
2. T	mrad	45	Rectangle uniform
3. Y	mm	0	Gaussian
4. P	mrad	0	Rectangle uniform
5. L	mm	0	Gaussian
6. D	%	5	Gaussian

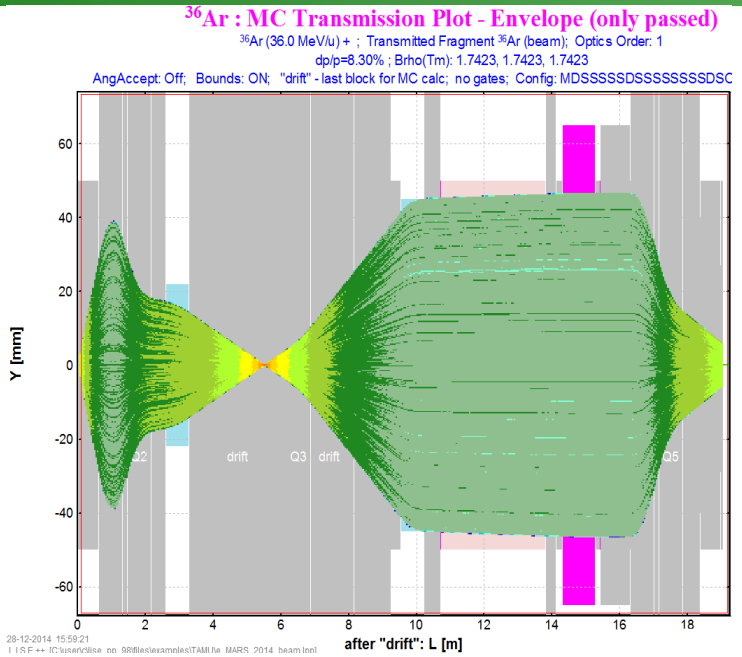




Y-envelopes

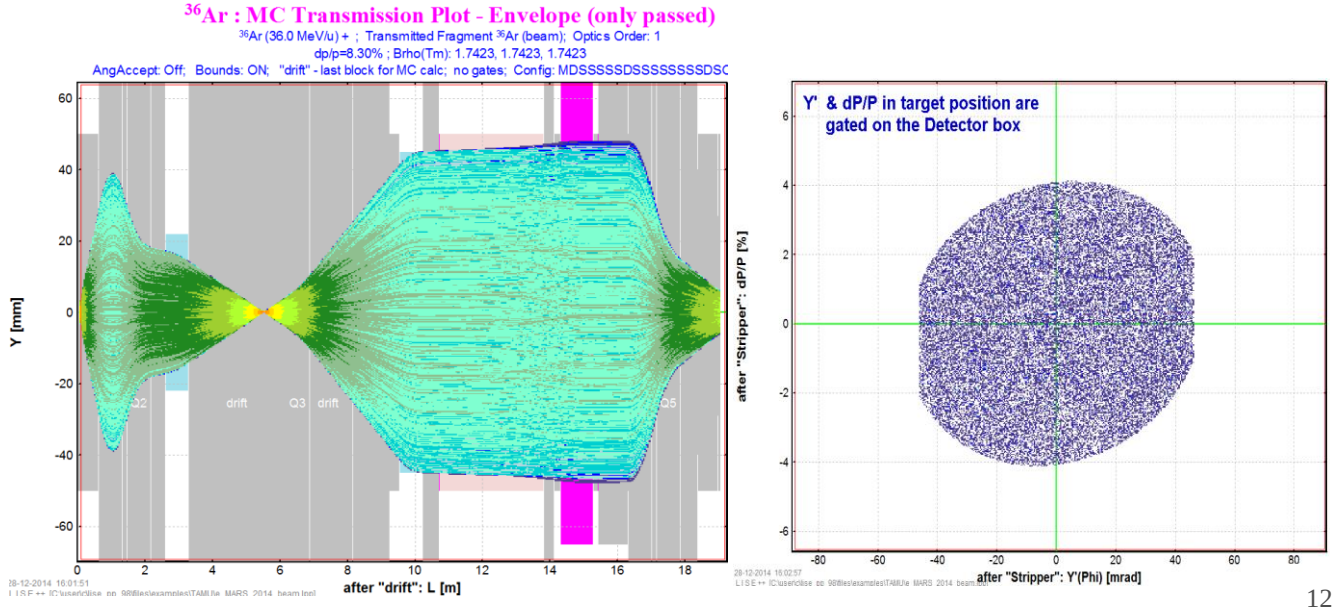
Emittance

	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	60	Rectangle uniform
5. L	mm	0	Gaussian
6. D	%	0	Gaussian



Emittance

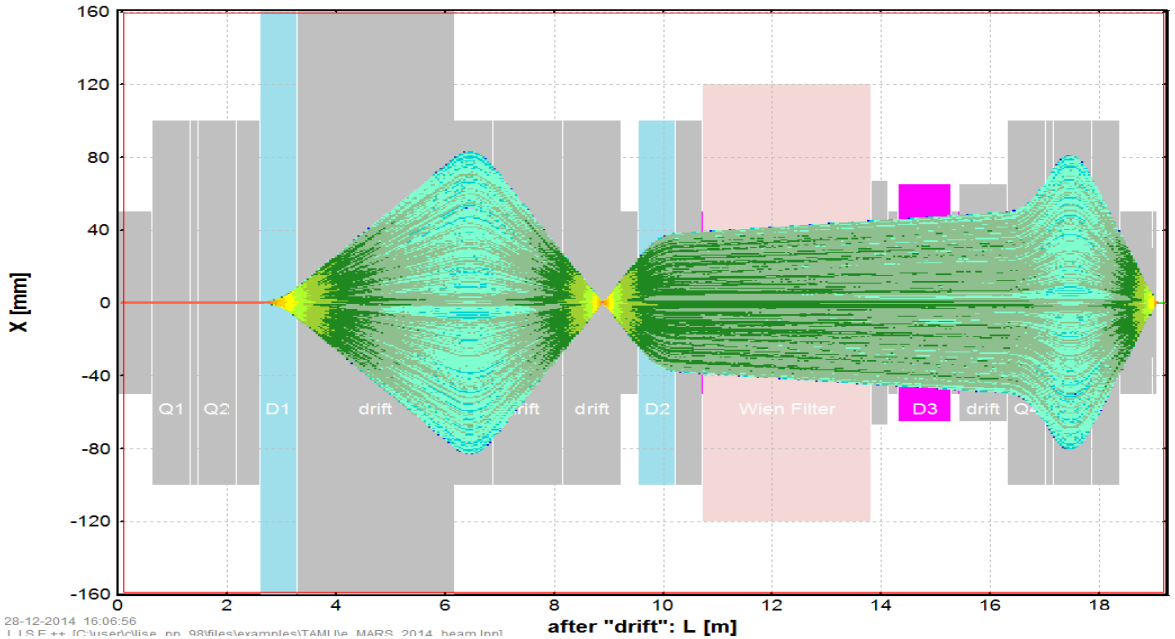
	Beam CARD (sigma, semi-axis, half-width...)		1D - shape (Distribution method)
1. X	mm	0	Gaussian
2. T	mrad	0	Rectangle uniform
3. Y	mm	0	Gaussian
4. P	mrad	60	Rectangle uniform
5. L	mm	0	Gaussian
6. D	%	6	Gaussian

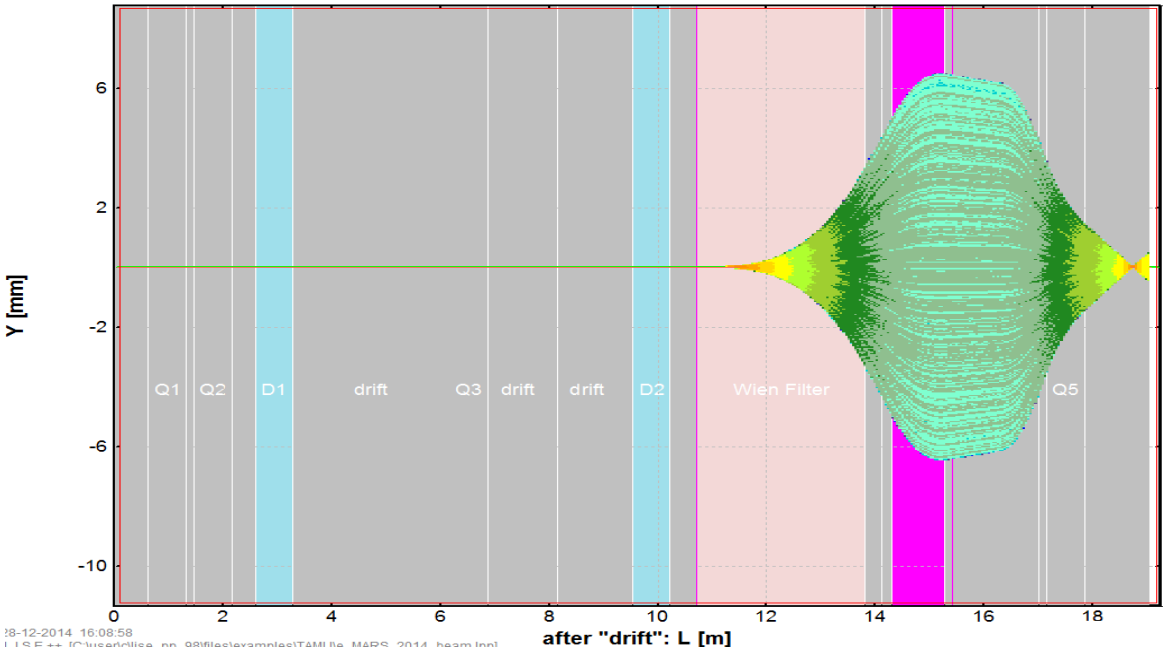


X & Y envelopes for dp/p=6%

Emittance

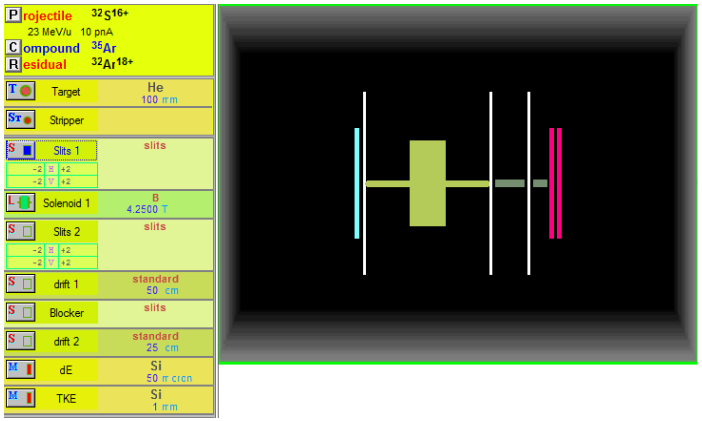
	Beam CARD (sigma, semi-axis, half-width...)		1D - shape (Distribution method)
1. X	mm	0	Gaussian
2. T	mrad	0	Rectangle uniform
3. Y	mm	0	Gaussian
4. P	mrad	0	Rectangle uniform
5. L	mm	0	Gaussian
6. D	%	6	Gaussian

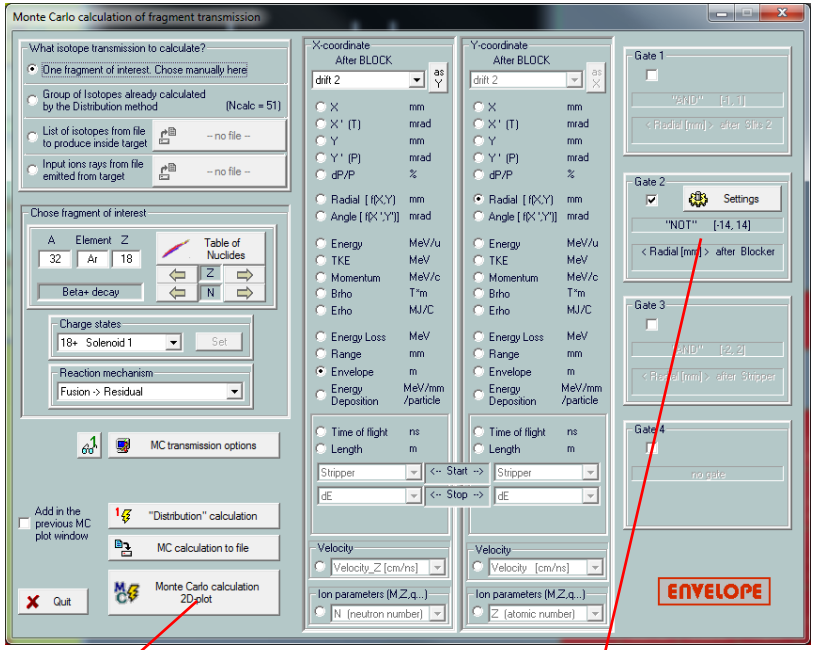




Momentum acceptance is limited in the X-plane!!

Solenoid





Effective in the Monte Carlo mode!
Use the Gate "Not" to simulate the "blocker"