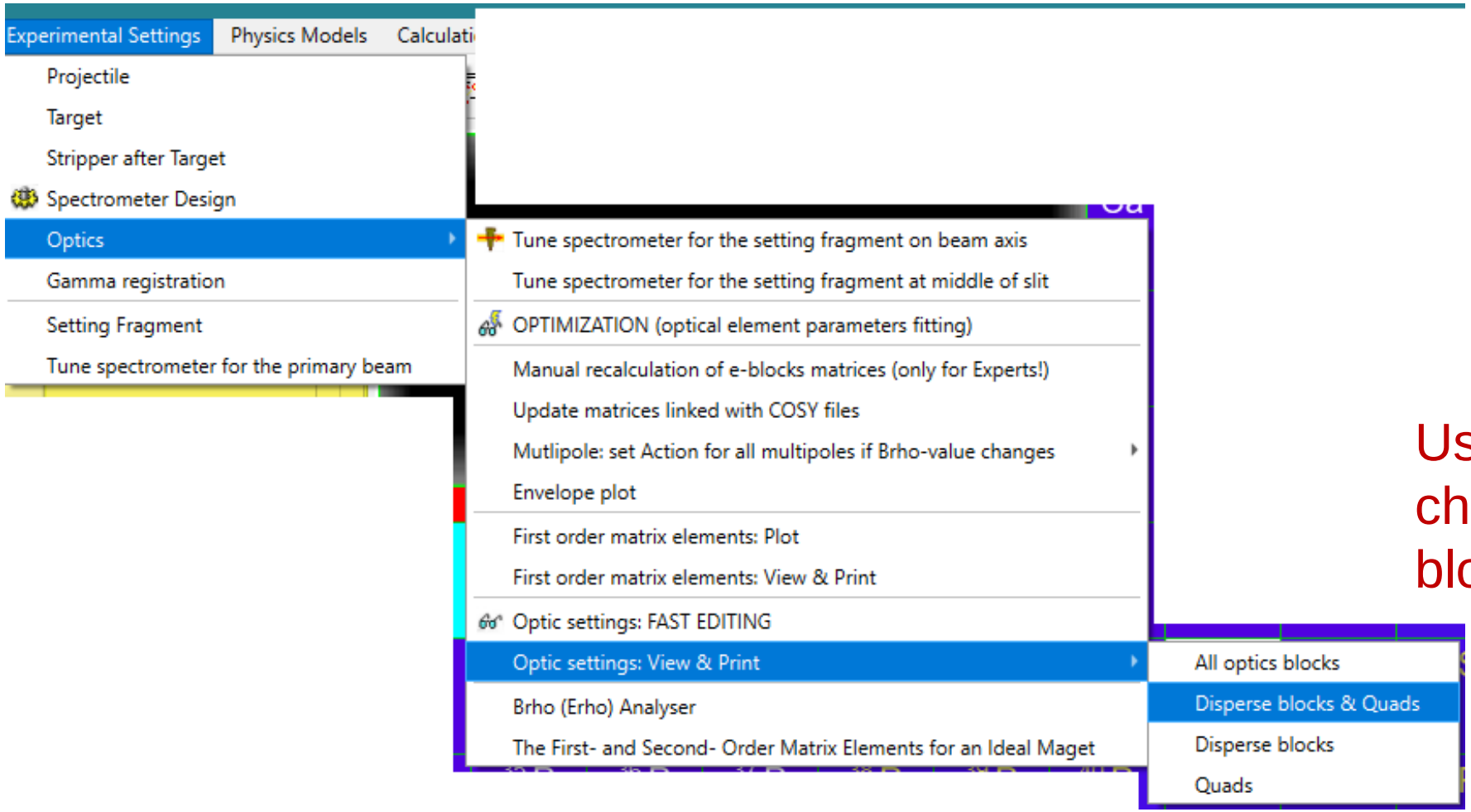
Working with e-configurations

v.16.12.15
03/24/23



Useful tool to check optics block settings

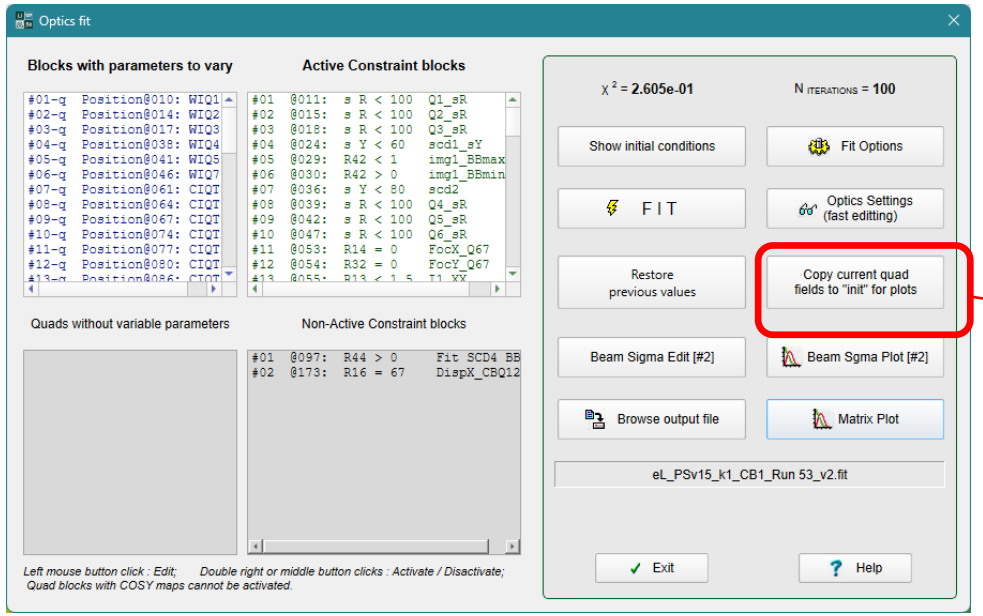
Optics settings preview : Quads only

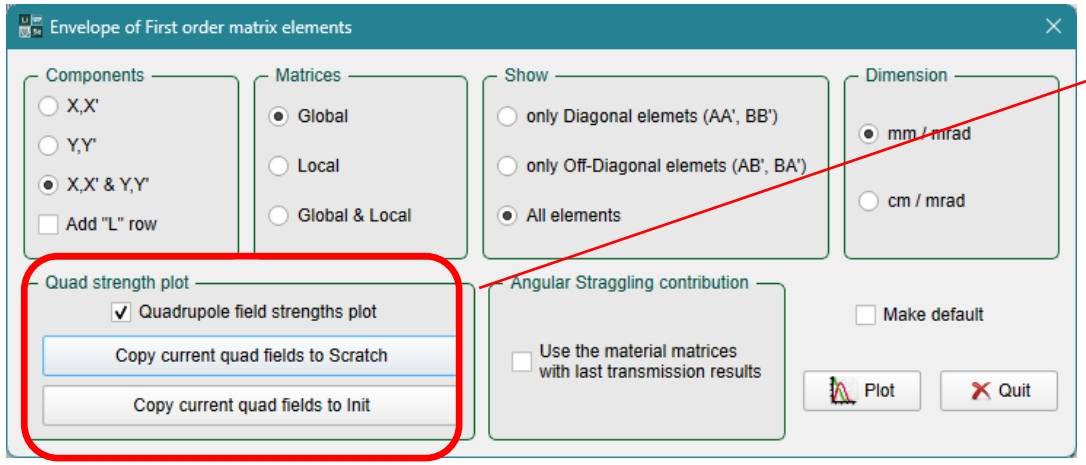
! FILE: C:/buffer_LAB/_experiments/FRIB/e22501_198Pt/_experiment/LISE-e/eL_PSv15_k1_CB1_Run 53_v2.lpp; Quads only

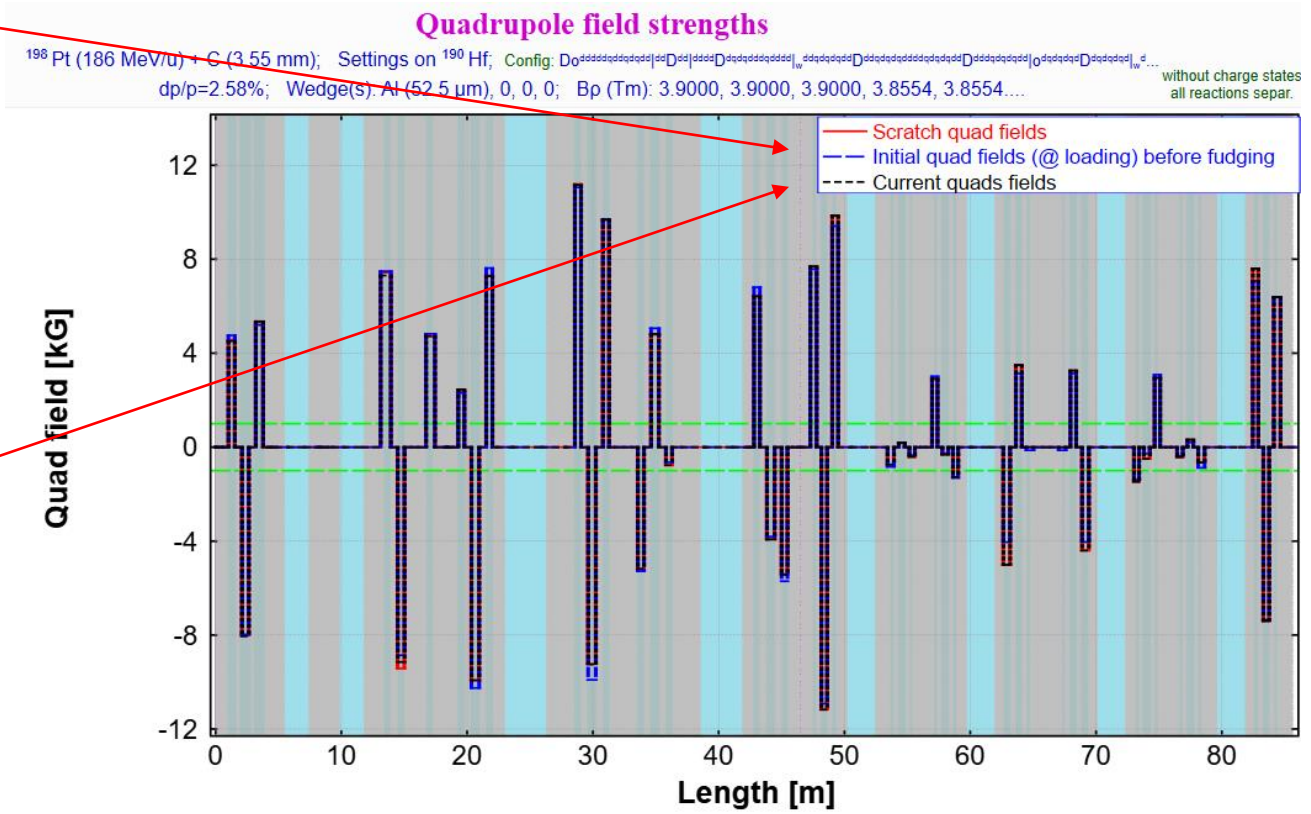
1 N or	2 Block name	3 Official name	4 Kind of Block	5 Start (m)	6 Length (m)	7 DriftMode Angle*	8 B0(kG)	9 Br-corrsp Br-dip*	10 Rapp(cm) R(m)*	11 L_eff(m) Len(m)*	12 2nd order	13 Calc Mode	14 AngAcc mode	15 Slits shape	16 Xmin slit	17 Xmax slit	18 Ymin slit	19 Ymax slit	20 Appert shape	21 Xmin limit	22 Xmax limit	23 Ymin limit	24 Ymax limit	25 I-curr (A)	26 Gradnt (T/m)	27 Leff mode	28 Calibration file
1.	WIQ1	FS_F1S1:Q_D1013	Drift	0.887	0.826	multipole	+4.756	3.9000	10.40	0.736	yes	1 R	--	ellps					ellps	-104	+104	-104	+104	+305.17	+4.5730	3	FRIB/FSQ1_2020.cal
2.	WIQ2	FS_F1S1:Q_D1024	Drift	1.850	1.050	multipole	-7.975	3.9000	13.00	0.827	yes	1 R	--	ellps					ellps	-125	+125	-125	+125	-156.36	-6.1350	3	FRIB/FSQ2_S2_2020.cal
3.	WIQ3	FS_F1S1:Q_D1035	Drift	2.950	1.050	multipole	+5.196	3.9000	13.00	0.821	yes	1 R	--	ellps					ellps	-130	+130	-130	+130	+103.22	+3.9970	3	FRIB/FSQ2_S2_2020.cal
4.	WIQ4	FS_F1S1:Q_D1137	Drift	13.314	0.700	multipole	+7.486	3.9000	20.00	0.794	yes	1 R	--	ellps					ellps	-200	+200	-200	+200	+125.94	+3.7430	3	FRIB/FSQ5_S1_2020.cal
5.	WIQ5	FS_F1S1:Q_D1148	Drift	14.402	0.700	multipole	-8.860	3.9000	20.00	0.798	yes	1 R	--	ellps					ellps	-200	+200	-200	+200	-151.82	-4.4300	3	FRIB/FSQ5_S1_2020.cal
6.	WIQ7	FS_F1S1:Q_D1170	Drift	16.689	0.700	multipole	+4.826	3.9000	20.00	0.797	yes	1 R	--	ellps					ellps	-200	+200	-200	+200	+81.41	+2.4130	3	FRIB/FSQ5_S3_2021.cal
7.	CIQT1A	FS_F1S2:Q_D1195	Drift	19.156	0.740	multipole	+2.306	3.8589	19.37	0.710	yes	1 R	--	ellps					ellps	-193	+193	-193	+193	+34.85	+1.1904	3	FRIB/FSQ7_S6_202009.cal
8.	CIQT1B	FS_F1S2:Q_D1207	Drift	20.177	0.950	multipole	-10.253	3.8589	19.37	0.944	yes	1 R	--	ellps					ellps	-193	+193	-193	+193	-172.57	-5.2933	3	FRIB/FSQ8_S2_202009.cal
9.	CIQT1C	FS_F1S2:Q_D1218	Drift	21.407	0.740	multipole	+7.620	3.8589	19.37	0.704	yes	1 R	--	ellps					ellps	-193	+193	-193	+193	+112.20	+3.9340	3	FRIB/FSQ7_S5_202009.cal
10.	CIQT2A	FS_F1S2:Q_D1288	Drift	28.431	0.740	multipole	+11.060	3.8554	19.37	0.689	yes	1 R	--	ellps					ellps	-193	+193	-193	+193	+162.38	+5.7100	3	FRIB/FSQ7_S3_202012_N71.cal
11.	CIQT2B	FS_F1S2:Q_D1299	Drift	29.451	0.950	multipole	-9.906	3.8554	19.37	0.943	yes	1 R	--	ellps					ellps	-193	+193	-193	+193	-163.12	-5.1140	3	FRIB/FSQ8_S3_202012_N81.cal
12.	CIQT2C	FS_F1S2:Q_D1311	Drift	30.682	0.740	multipole	+9.695	3.8554	19.37	0.695	yes	1 R	--	ellps					ellps	-193	+193	-193	+193	+145.04	+5.0050	3	FRIB/FSQ7_S4_202012_N73.cal
13.	CIQT3A	FS_F1S2:Q_D1338	Drift	33.438	0.740	multipole	-5.280	3.8554	19.37	0.710	yes	1 R	--	ellps					ellps	-193	+193	-193	+193	-78.59	-2.7260	3	FRIB/FSQ7_S1_202103_N71.cal
14.	CIQT3B	FS_F1S2:Q_D1349	Drift	34.458	0.950	multipole	+5.061	3.8554	19.37	0.939	yes	1 R	--	ellps					ellps	-193	+193	-193	+193	+83.36	+2.6130	3	FRIB/FSQ8_S1_202103_N81.cal
15.	CIQT3C	FS_F1S2:Q_D1361	Drift	35.689	0.740	multipole	-0.643	3.8554	19.37	0.709	yes	1 R	--	ellps					ellps	-193	+193	-193	+193	-9.54	-0.3320	3	FRIB/FSQ7_S2_202103_N73.cal
16.	CIQT4A	FS_F1S2:Q_D1430	Drift	42.681	0.680	multipole	+6.805	3.8554	15.00	0.672	yes	1 R	--	ellps					ellps	-143	+143	-143	+143	+88.83	+4.5370	3	FRIB/FSQ9_S2_202207_N71.cal
17.	CIQT4B	FS_F1S2:Q_D1441	Drift	43.700	0.880	multipole	-3.808	3.8554	15.00	0.873	yes	1 R	--	ellps					ellps	-143	+143	-143	+143	-49.99	-2.5390	3	FRIB/FSQ10_S1_202207_N81.cal
18.	CIQT4C	FS_F1S2:Q_D1453	Drift	44.918	0.680	multipole	-5.709	3.8554	15.00	0.676	yes	1 R	--	ellps					ellps	-143	+143	-143	+143	-74.01	-3.8060	3	FRIB/FSQ9_S1_202207_N73.cal
19.	Q_D1476	FS_F2S1:Q_D1476	Drift	47.418	0.420	multipole	+7.578	3.8554	15.00	0.431	yes	1 R	--	ellps					ellps	-100	+100	-100	+100	+15.90	+5.0520	3	FRIB/FSQB_n2.cal
20.	Q_D1484	FS_F2S1:Q_D1484	Drift	48.035	0.700	multipole	-10.916	3.8554	15.00	0.731	yes	1 R	--	ellps					ellps	-116	+116	-116	+116	-30.10	-7.2770	3	FRIB/FSQE_n2.cal
21.	Q_D1492	FS_F2S1:Q_D1492	Drift	48.953	0.486	multipole	+9.414	3.8554	21.00	0.522	yes	1 R	--	ellps					ellps	-170	+170	-170	+170	+93.98	+4.4830	3	FRIB/FSQD_n2.cal
22.	Q_D1538	FS_F2S1:Q_D1538	Drift	53.581	0.420	multipole	-0.835	3.8554	15.00	0.431	yes	1 R	--	ellps					ellps	-100	+100	-100	+100	-1.75	-0.5570	3	FRIB/FSQB_n2.cal
23.	Q_D1545	FS_F2S1:Q_D1545	Drift	54.153	0.790	multipole	+0.178	3.8554	15.00	0.820	yes	1 R	--	ellps					ellps	-100	+100	-100	+100	+0.51	+0.1190	3	FRIB/FSQC_n2.cal
24.	Q_D1553	FS_F2S1:Q_D1553	Drift	55.094	0.420	multipole	-0.345	3.8554	15.00	0.431	yes	1 R	--	ellps					ellps	-100	+100	-100	+100	-0.72	-0.2300	3	FRIB/FSQB_n2.cal
25.	Q_D1573	FS_F2S2:Q_D1573	Drift	57.046	0.420	multipole	+3.009	3.8554	15.00	0.431	yes	1 R	--	ellps					ellps	-100	+100	-100	+100	+6.31	+2.0060	3	FRIB/FSQB_n2.cal
26.	Q_D1580	FS_F2S2:Q_D1580	Drift	57.618	0.790	multipole	-0.264	3.8554	15.00	0.820	yes	1 R	--	ellps					ellps	-100	+100	-100	+100	-0.75	-0.1760	3	FRIB/FSQC_n2.cal
27.	Q_D1588	FS_F2S2:Q_D1588	Drift	58.560	0.420	multipole	-1.305	3.8554	15.00	0.431	yes	1 R	--	ellps					ellps	-100	+100	-100	+100	-2.74	-0.8700	3	FRIB/FSQB_n2.cal
28.	Q_D1629	FS_F2S2:Q_D1629	Drift	62.574	0.723	multipole	-4.045	3.8554	13.30	0.748	yes	1 R	--	ellps					ellps	-100	+100	-100	+100	-10.65	-3.0410	3	FRIB/FSQA_n2.cal
29.	Q_D1639	FS_F2S2:Q_D1639	Drift	63.498	0.723	multipole	+3.137	3.8554	13.30	0.748	yes	1 R	--	ellps					ellps	-100	+100	-100	+100	+8.26	+2.3590	3	FRIB/FSQA_n2.cal
30.	Q_D1646	FS_F2S2:Q_D1646	Drift	64.410	0.420	multipole	-0.135	3.8554	15.00	0.431	yes	1 R	--	ellps					ellps	-100	+100	-100	+100	-0.28	-0.0900	3	FRIB/FSQB_n2.cal
31.	Q_D1674	FS_F3S1:Q_D1674	Drift	67.231	0.400	multipole	-0.135	3.8554	15.00	0.431	yes	1 R	--	ellps					ellps	-100	+100	-100	+100	-0.28	-0.0900	3	FRIB/FSQB_n2.cal
32.	Q_D1682	FS_F3S1:Q_D1682	Drift	67.831	0.723	multipole	+3.133	3.8554	13.30	0.748	yes	1 R	--	ellps					ellps	-100	+100	-100	+100	+8.25	+2.3560	3	FRIB/FSQA_n2.cal
33.	Q_D1691	FS_F3S1:Q_D1691	Drift	68.754	0.723	multipole	-4.038	3.8554	13.30	0.748	yes	1 R	--	ellps					ellps	-100	+100	-100	+100	-10.63	-3.0360	3	FRIB/FSQA_n2.cal
34.	Q_D1733	FS_F3S1:Q_D1733	Drift	73.071	0.420	multipole	-1.386	3.8499	15.00	0.431	yes	1 R	--	ellps					ellps	-100	+100	-100	+100	-2.91	-0.9240	3	FRIB/FSQB_n2.cal
35.	Q_D1740	FS_F3S1:Q_D1740	Drift	73.643	0.790	multipole	-0.272	3.8499	15.00	0.820	yes	1 R	--	ellps					ellps	-100	+100	-100	+100	-0.77	-0.1810	3	FRIB/FSQC_n2.cal
36.	Q_D1748	FS_F3S1:Q_D1748	Drift	74.585	0.420	multipole	+3.083	3.8499	15.00	0.431	yes	1 R	--	ellps					ellps	-100	+100	-100	+100	+6.46	+2.0550	3	FRIB/FSQB_n2.cal
37.	Q_D1767	FS_F3S2:Q_D1767	Drift	76.537	0.420	multipole	-0.375	3.8499	15.00	0.431	yes	1 R	--	ellps					ellps	-100	+100	-100	+100	-0.79	-0.2500	3	FRIB/FSQB_n2.cal
38.	Q_D1775	FS_F3S2:Q_D1775	Drift	77.109	0.790	multipole	+0.201	3.8499	15.00	0.820	yes	1 R	--	ellps					ellps	-100	+100	-100	+100	+0.57	+0.1340	3	FRIB/FSQC_n2.cal
39.	Q_D1783	FS_F3S2:Q_D1783	Drift	78.050	0.420	multipole	-0.882	3.8499	15.00	0.431	yes	1 R	--	ellps					ellps	-100	+100	-100	+100	-1.85	-0.5880	3	FRIB/FSQB_n2.cal
40.	Q_D1827	FS_F3S2:Q_D1827	Drift	82.475	0.486	multipole	+7.071	3.8499	21.00	0.522	yes	1 R	--	ellps					ellps	-170	+170	-170	+170	+70.59	+3.3670	3	FRIB/FSQD_n2.cal
41.	Q_D1835	FS_F3S2:Q_D1835	Drift	83.179	0.700	multipole	-7.351	3.8499	15.00	0.731	yes	1 R	--	ellps					ellps	-116	+116	-116	+116	-20.27	-4.9010	3	FRIB/FSQE_n2.cal
42.	Q_D1843	FS_F3S2:Q_D1843	Drift	84.076	0.420	multipole	+6.394	3.8499	15.00	0.431	yes	1 R	--	ellps					ellps	-100	+100	-100	+100	+13.40	+4.2630	3	FRIB/FSQB_n2.cal

! symbol "*" after values denotes, that these values belongs to Dipole settings, where column names are found in the second row of titles, and also marked by "*"
! Column 09: "Br-corrsp" - quadrupole(sextupole) field is scaled to this Brho-value; "Br-dip*" - dipole magnetic rigidity [T*m]

Quad strengths to plot







Optics minimization

C:/Users/taras/Documents/LISEcute/results/eL_PSv15_k1_CB1_Run 53_v2.fit

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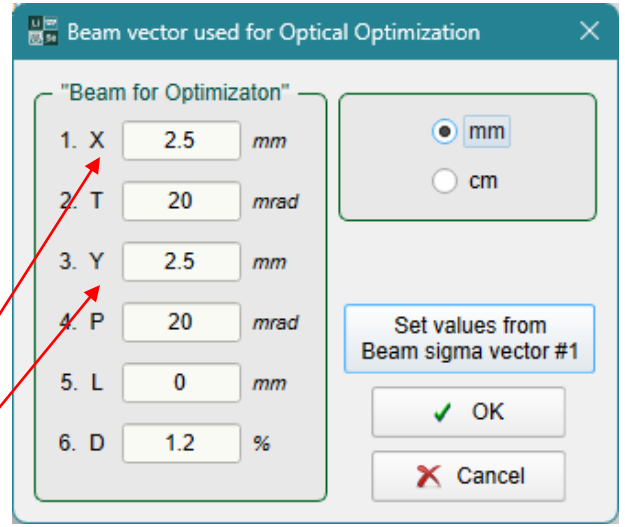
chi2: Initial    17046.5  and Final  0.201076  LISE fit reduced values
chi1: Initial     296046  and Final  0.322848  LISE fit reduced values

Parameters:          LeftBound     Initial       RightBound |     Final     abs dif,%
#01-q: WIQ1       -2.0e+01  <  +4.756e+00  <  +2.0e+01   | +4.538e+00      -4.6
#02-q: WIQ2       -2.0e+01  <  -7.975e+00  <  +2.0e+01   | -8.046e+00      +0.9
#03-q: WIQ3       -2.0e+01  <  +5.196e+00  <  +2.0e+01   | +5.286e+00      +1.7
#04-q: WIQ4       -2.0e+01  <  +7.486e+00  <  +2.0e+01   | +7.378e+00      -1.4
#05-q: WIQ5       -2.0e+01  <  -8.860e+00  <  +2.0e+01   | -9.108e+00      +2.8
#06-q: WIQ7       -2.0e+01  <  +4.826e+00  <  +2.0e+01   | +4.714e+00      -2.3
#07-q: CIQT1A     -2.0e+01  <  +2.306e+00  <  +2.0e+01   | +2.418e+00      +4.9
#08-q: CIQT1B     -2.0e+01  <  -1.025e+01  <  +2.0e+01   | -9.926e+00      -3.2
#09-q: CIQT1C     -2.0e+01  <  +7.620e+00  <  +2.0e+01   | +7.289e+00      -4.3
#10-q: CIQT2A     -2.0e+01  <  +1.106e+01  <  +2.0e+01   | +1.117e+01      +1.0
#11-q: CIQT2B     -2.0e+01  <  -9.906e+00  <  +2.0e+01   | -9.240e+00      -6.7
#12-q: CIQT2C     -2.0e+01  <  +9.695e+00  <  +2.0e+01   | +9.679e+00      -0.2
#13-q: CIQT3A     -2.0e+01  <  -5.280e+00  <  +2.0e+01   | -5.188e+00      -1.8
#14-q: CIQT3B     -2.0e+01  <  +5.061e+00  <  +2.0e+01   | +4.796e+00      -5.2
#15-q: CIQT3C     -2.0e+01  <  -6.431e-01  <  +2.0e+01   | -7.703e-01     +19.8
#16-q: CIQT4A     -2.0e+01  <  +6.805e+00  <  +2.0e+01   | +6.438e+00      -5.4
#17-q: CIQT4B     -2.0e+01  <  -3.808e+00  <  +2.0e+01   | -3.931e+00      +3.2
#18-q: CIQT4C     -2.0e+01  <  -5.709e+00  <  +2.0e+01   | -5.436e+00      -4.8
#19-q: Q_D1476    -2.0e+01  <  +7.578e+00  <  +2.0e+01   | +7.694e+00      +1.5
#20-q: Q_D1484    -2.0e+01  <  -1.092e+01  <  +0.0e+00   | -1.117e+01      +2.3
#21-q: Q_D1492    -2.0e+01  <  +9.414e+00  <  +2.0e+01   | +9.856e+00      +4.7
#22-q: Q_D1538    -2.0e+01  <  -8.355e-01  <  +2.0e+01   | -7.438e-01     -11.0
#23-q: Q_D1545    -2.0e+01  <  +1.785e-01  <  +2.0e+01   | +1.850e-01      +3.6
#24-q: Q_D1553    -2.0e+01  <  -3.450e-01  <  +2.0e+01   | -4.135e-01     +19.8
#25-q: Q_D1573    -2.0e+01  <  +3.009e+00  <  +2.0e+01   | +2.906e+00      -3.4
#26-q: Q_D1580    -2.0e+01  <  -2.640e-01  <  +2.0e+01   | -3.124e-01     +18.3
#27-q: Q_D1588    -2.0e+01  <  -1.305e+00  <  +2.0e+01   | -1.274e+00      -2.3
#28-q: Q_D1629    -2.0e+01  <  -4.045e+00  <  +2.0e+01   | -5.015e+00     +24.0
#29-q: Q_D1639    -2.0e+01  <  +3.137e+00  <  +2.0e+01   | +3.499e+00     +11.5
#30-q: Q_D1646    -2.0e+01  <  -1.350e-01  <  +2.0e+01   | +1.470e-03     -98.9  sign changed!
#31-q: Q_D1674    -2.0e+01  <  -1.350e-01  <  +2.0e+01   | -4.980e-03     -96.3
```

new feature



It looks like these large X & Y spot sizes (instead 0.2 mm) work better against large spatial magnification matrix elements

Update of Debug information table

Debug Information (for last calculation)

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Debug distribution characteristics
(the data are shown after blocks)

New columns

Block name	sPd(MeVc)	sPu(MeVc)	sX(mm)	sY(mm)	P-min	P-max	x-min	x-max	y-min	y-max	a-min	a-max	b-min	b-max	dX/dP	dY/dP	-deltaX(P)	+deltaX(P)	-deltaY(P)	+deltaY(P)
Stripper	0.00	0.00	0.30	0.30	49957	58887	-0.0	0.0	-0.0	0.0	-0.0	0.0	-0.0	0.0	+7.2e-08	+7.2e-08	0.00	0.00	0.00	0.00
shield	0.00	0.00	6.36	6.36	50097	58747	-0.0	0.0	-0.0	0.0	-0.0	0.0	-0.0	0.0	+1.1e-07	+1.1e-07	0.00	0.00	0.00	0.00
RAm90	0.00	0.00	6.36	6.36	50097	58747	-0.0	0.0	-0.0	0.0	-0.0	0.0	-0.0	0.0	+1.1e-07	-1.1e-07	0.00	0.00	0.00	0.00
PS1A	0.00	0.00	2.06	25.21	50097	58747	-66.5	81.1	-0.0	0.0	-37.3	45.5	-0.0	0.0	+1.7e-02	-1.2e-08	0.00	0.00	0.00	0.00
Beam Dump	0.00	0.00	2.06	25.21	50097	58747	-66.5	81.1	-0.0	0.0	-37.3	45.5	-0.0	0.0	+1.7e-02	-1.2e-08	0.00	0.00	0.00	0.00
Frag Catchers	0.00	0.00	2.06	25.21	50097	58747	-66.5	81.1	-0.0	0.0	-37.3	45.5	-0.0	0.0	+1.7e-02	-1.2e-08	0.00	0.00	0.00	0.00
PS1B	0.00	0.00	0.41	0.37	50097	58747	-225.4	184.8	-0.0	0.0	-0.0	0.0	-0.0	0.0	-4.7e-02	+8.9e-08	0.00	0.00	0.00	0.00
PS_I_slits	0.00	0.00	0.41	0.37	53920	54068	-3.5	3.5	-0.0	-0.0	-0.0	-0.0	0.0	0.0	-4.7e-02	+8.9e-08	0.00	0.00	0.00	0.00
PS_wdg	124.30	123.66	0.41	0.37	46907	46948	-3.5	3.5	-0.0	-0.0	-0.0	-0.0	0.0	0.0	-1.7e-01	+3.3e-07	0.00	0.00	0.00	0.00
PS1C	124.30	123.66	28.83	7.59	46907	46948	23.0	28.9	0.0	0.0	1.2	1.9	-0.0	-0.0	+1.5e-01	-7.7e-07	20.03	20.13	0.00	0.00
PS1D	124.30	123.66	0.49	0.45	46907	46948	-28.6	-28.3	-0.0	-0.0	-8.4	-8.3	0.0	0.0	-7.8e-03	+4.0e-07	26.09	26.23	0.00	0.00
PS_FP_slit	6.68	6.64	0.49	0.45	46908	46948	-28.6	-28.3	-0.0	-0.0	-8.4	-8.3	0.0	0.0	-7.9e-03	+4.0e-07	1.40	1.41	0.00	0.00
RA90	6.68	6.64	0.45	0.49	46908	46948	0.0	0.0	-28.6	-28.3	-0.0	-0.0	-8.4	-8.3	-4.0e-07	-7.9e-03	0.00	0.00	1.40	1.41
C_D1	6.68	6.64	0.63	0.69	46908	46948	-8.8	-6.8	41.4	41.9	0.0	0.0	-24.5	-24.2	+4.9e-02	+1.2e-02	0.32	0.33	2.05	2.06
DB2 slits	6.68	6.64	0.63	0.69	46908	46948	-8.8	-6.8	41.4	41.9	0.0	0.0	-24.5	-24.2	+4.9e-02	+1.2e-02	0.32	0.33	2.05	2.06
DB2 Wedge	6.68	6.64	0.63	0.69	46908	46948	-8.8	-6.8	41.4	41.9	0.0	0.0	-24.5	-24.2	+4.9e-02	+1.2e-02	0.32	0.33	2.05	2.06
C_D2	6.68	6.64	0.37	0.70	46908	46948	0.0	0.0	-44.5	-44.0	-0.0	-0.0	44.2	44.7	-3.5e-05	-1.2e-02	0.00	0.00	2.19	2.21
FS_F2S2:SLH_D	6.68	6.64	0.37	0.70	46908	46948	0.0	0.0	-44.5	-44.0	-0.0	-0.0	44.2	44.7	-3.5e-05	-1.2e-02	0.00	0.00	2.19	2.21
C_D3	6.68	6.65	0.62	0.51	46908	46948	-7.4	-5.4	39.0	39.4	0.0	0.0	-71.3	-70.5	+4.9e-02	+1.1e-02	0.32	0.33	2.02	2.03
C_D4	6.68	6.65	1.52	2.81	46908	46948	0.0	0.0	-206.3	-204.0	-0.0	-0.0	16.1	16.3	-9.7e-08	-5.7e-02	0.00	0.00	4.91	4.93

Should be investigated.
Possible reason of low contamination rates (Marc's request)