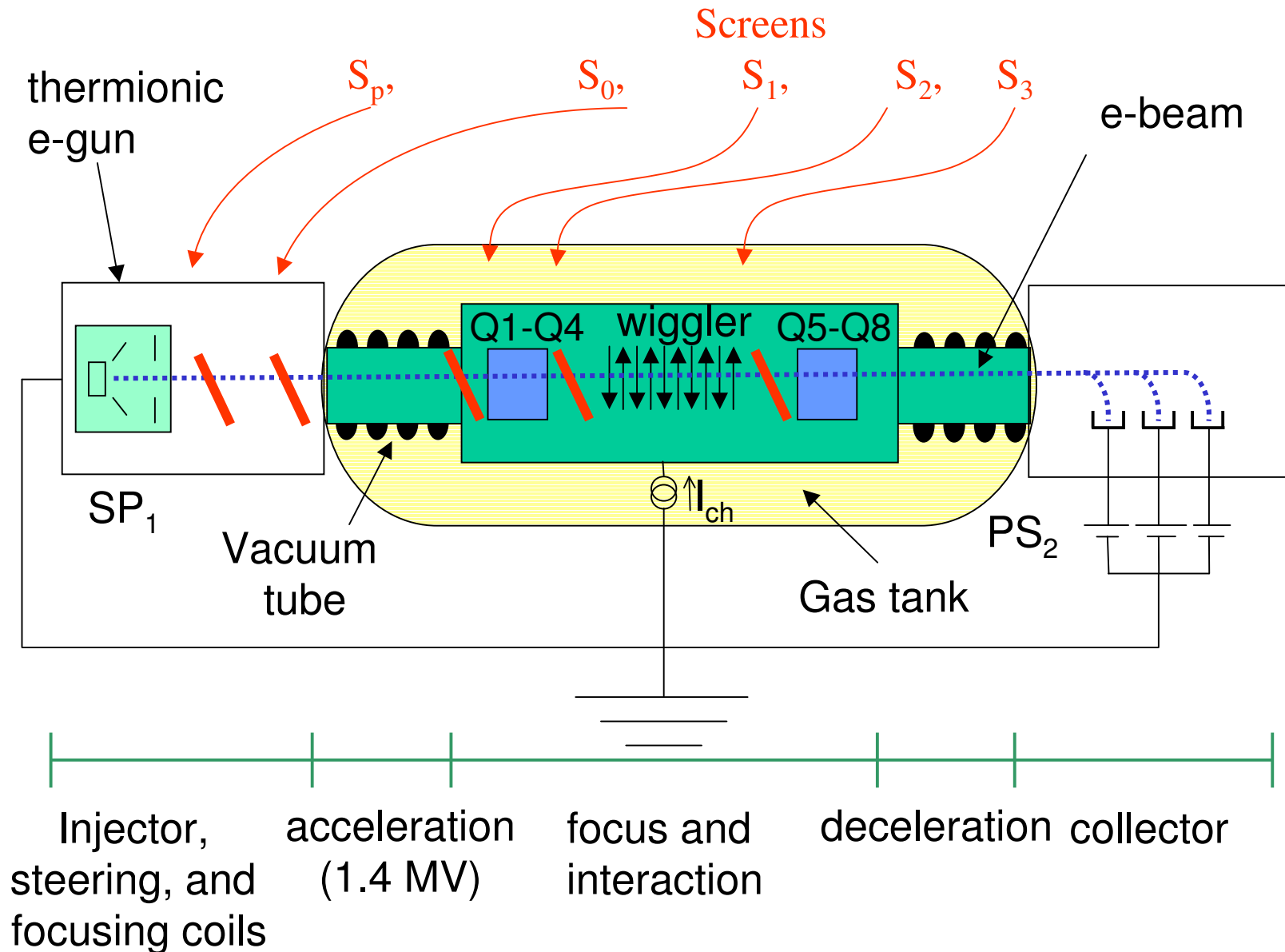
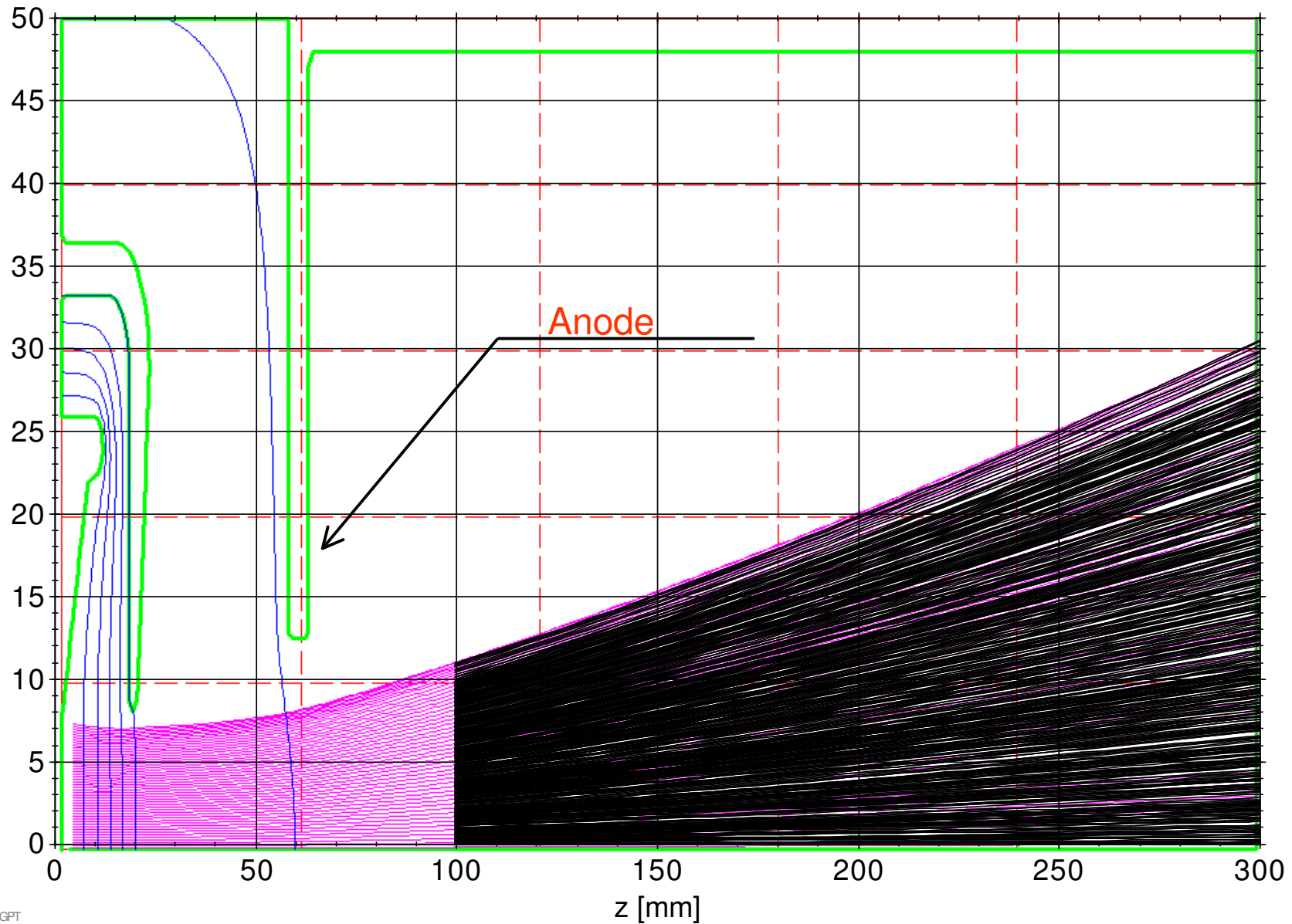


GPT simulation results at injector and
terminal region

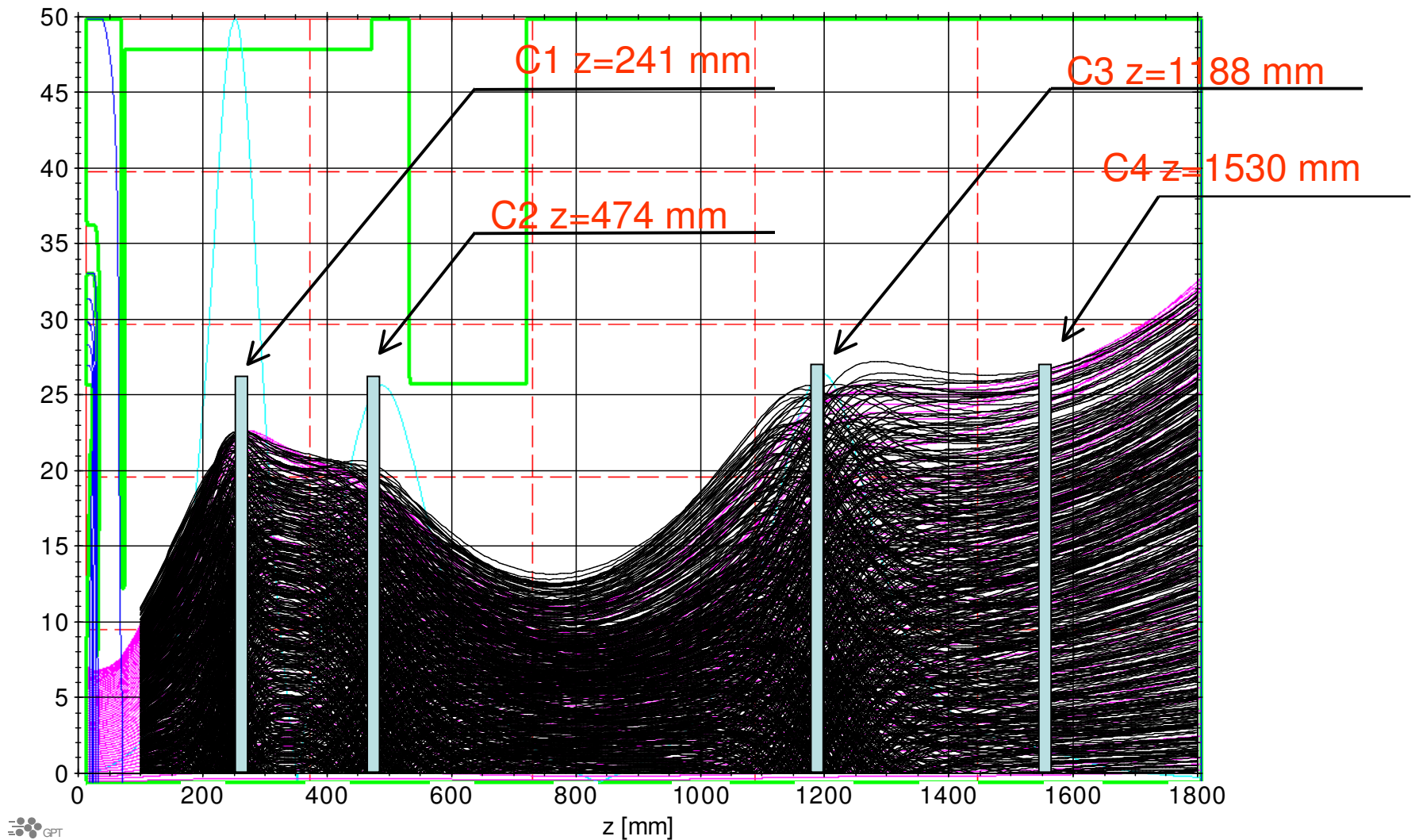
Scheme of the FEL



E-GUN 2 GPT (without focusing coils)



E-GUN 2 GPT + C1 – C4



GPT Runs Result at Sp

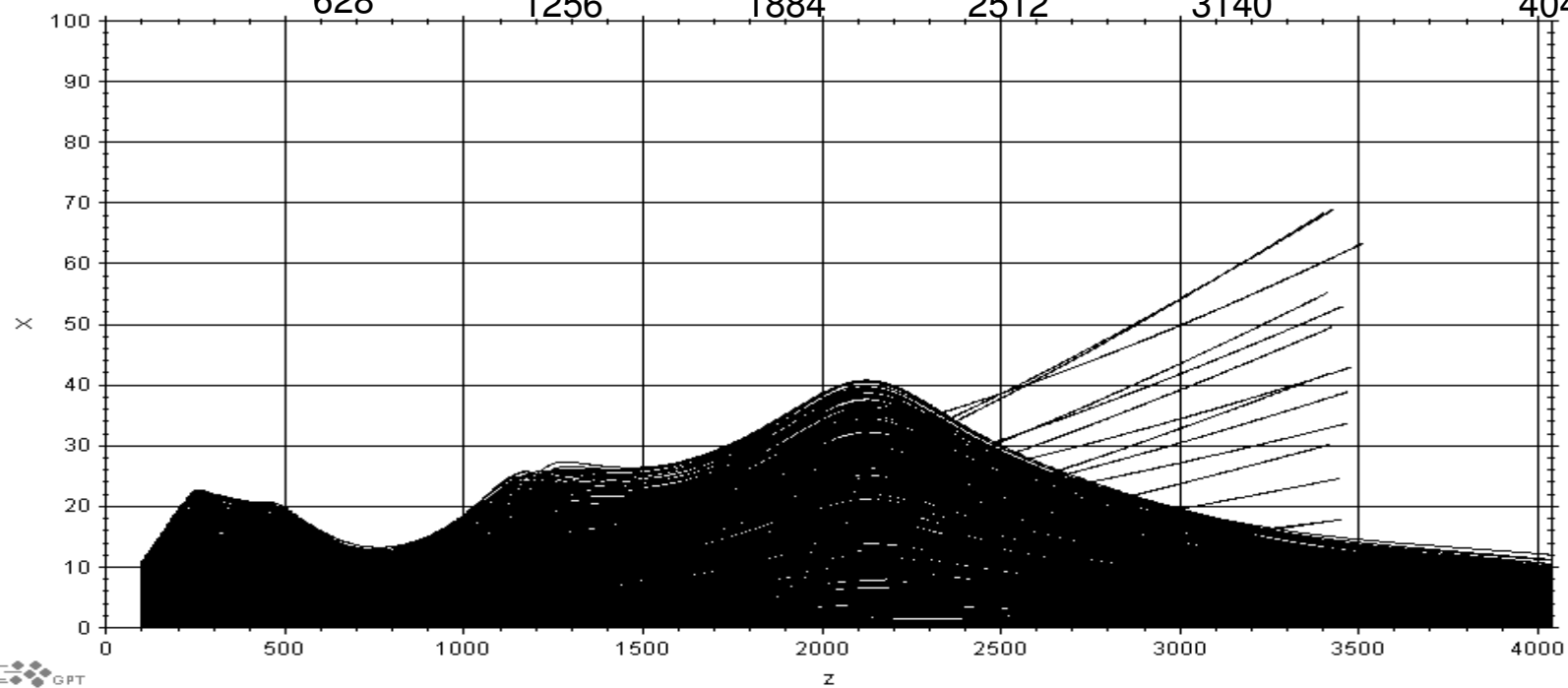
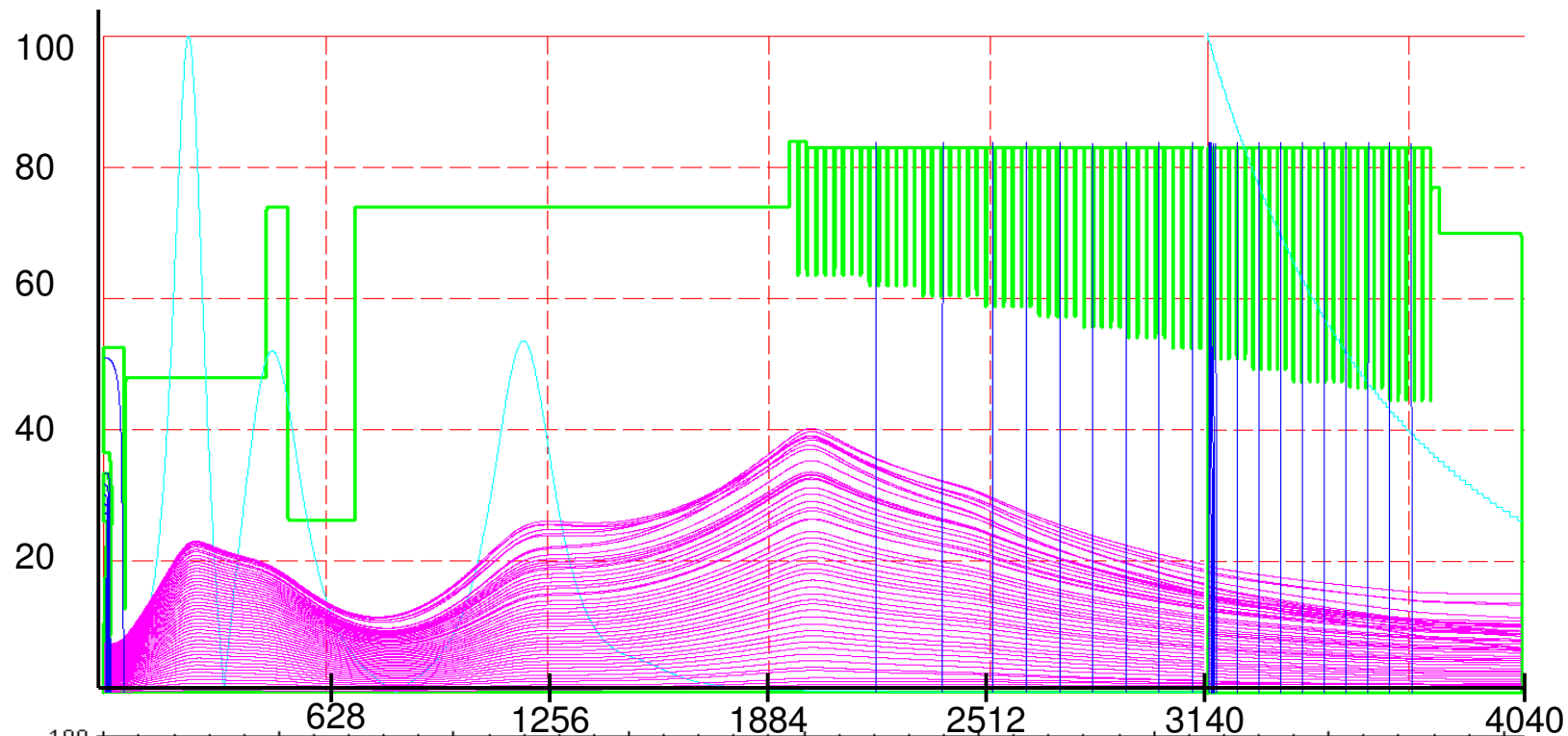
C1, [A]	C1, [A]	Beam diameter, Experiment X [mm]	Beam diameter, experiment Y [mm]	Beam diameter, simulation X [mm]	Beam diameter, simulation Y [mm]
-7.5	3.2	33	34	35.5	35.5
-7.8	3.2	29	30	32	32
-8	3.2	28	28	29.5	30
-8	3	29	32	32	32
-8	3.5	25	25	27	27
-8	3.8	22	22	24	24
-8	4	20	19	22	22
-8	4.2	19	18	20	19.5

Average error X,Y ~8%

GPT Runs Result at S0

C1, [A]	C2, [A]	C3, [A]	C4, [A]	Beam radius, Experiment X [mm]	Beam radius, Experiment Y [mm]	Beam radius Simulation, X [mm]	Beam radius simulation, Y [mm]
-8	4	3.3	2	35-33	32-33	34.5	34.5
-8	4	3.5	2	31-30	28-29	31	31
-8	4	3.6	2	29-27.5	27-28	30	30
-8	4	3.8	2	26-24.5	24-25	27	27
-8	4	3.8	1.5	26-25	23-24	28.5	28.5
-8	4	3.8	2.5	24-23.5	21-22	25	25
-8	4	3.8	3	42-41	36-37	44	44
-8	4	3.8	3.5	37.5-37	31-32	39	39
-8	4	3.8	4	27.5-27	23-24	34	34
-8	4	3.8	4.5	18.5-18	16-17	28	28

Average error X~ 9%,
Y~12%

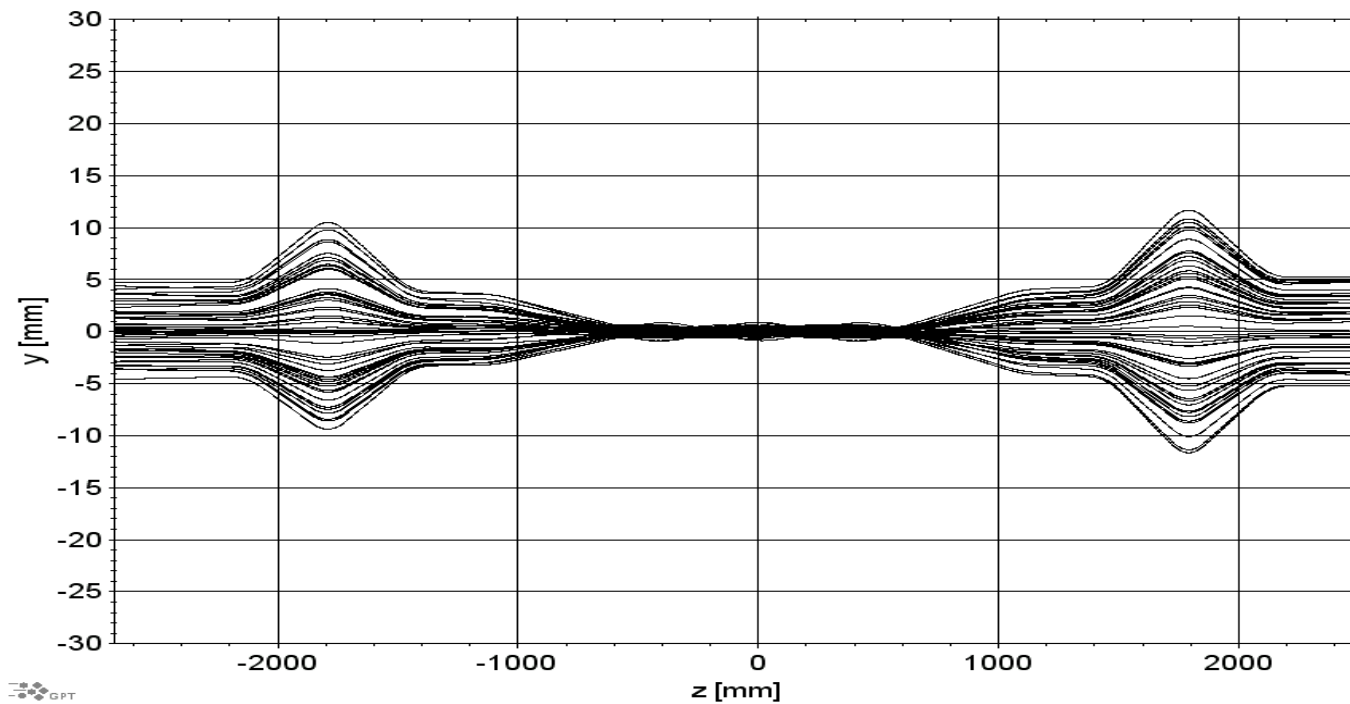
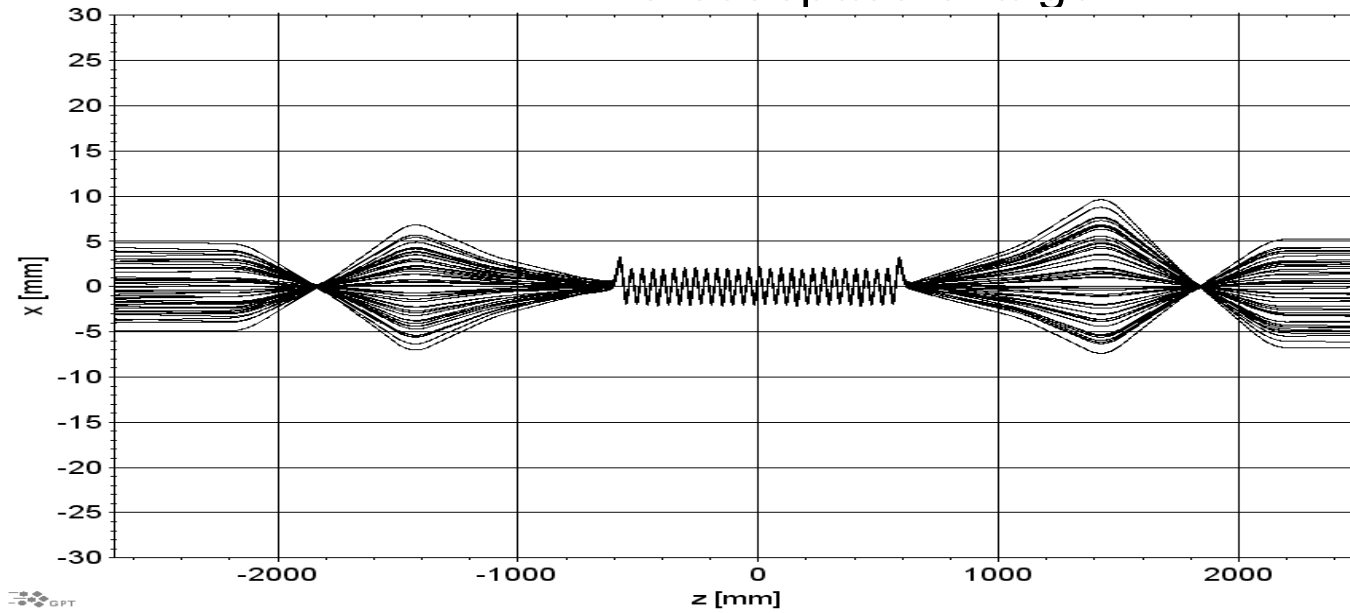


GPT Runs Result at S1

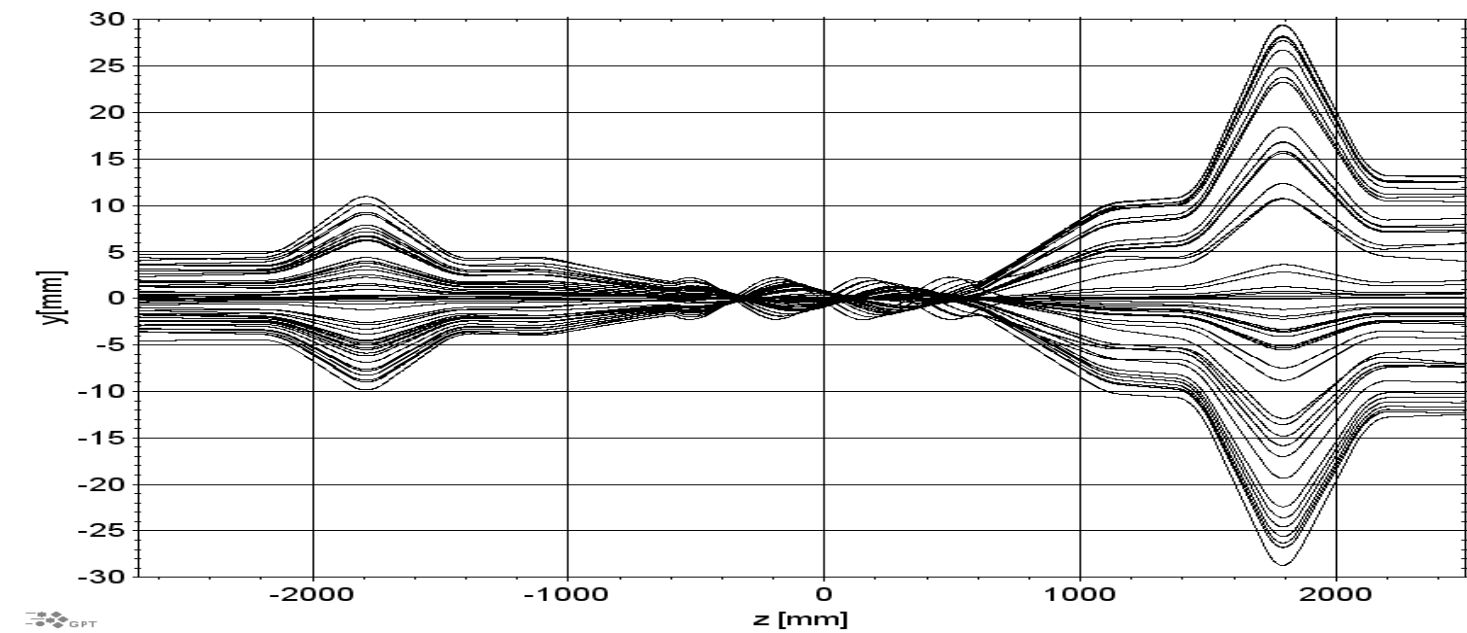
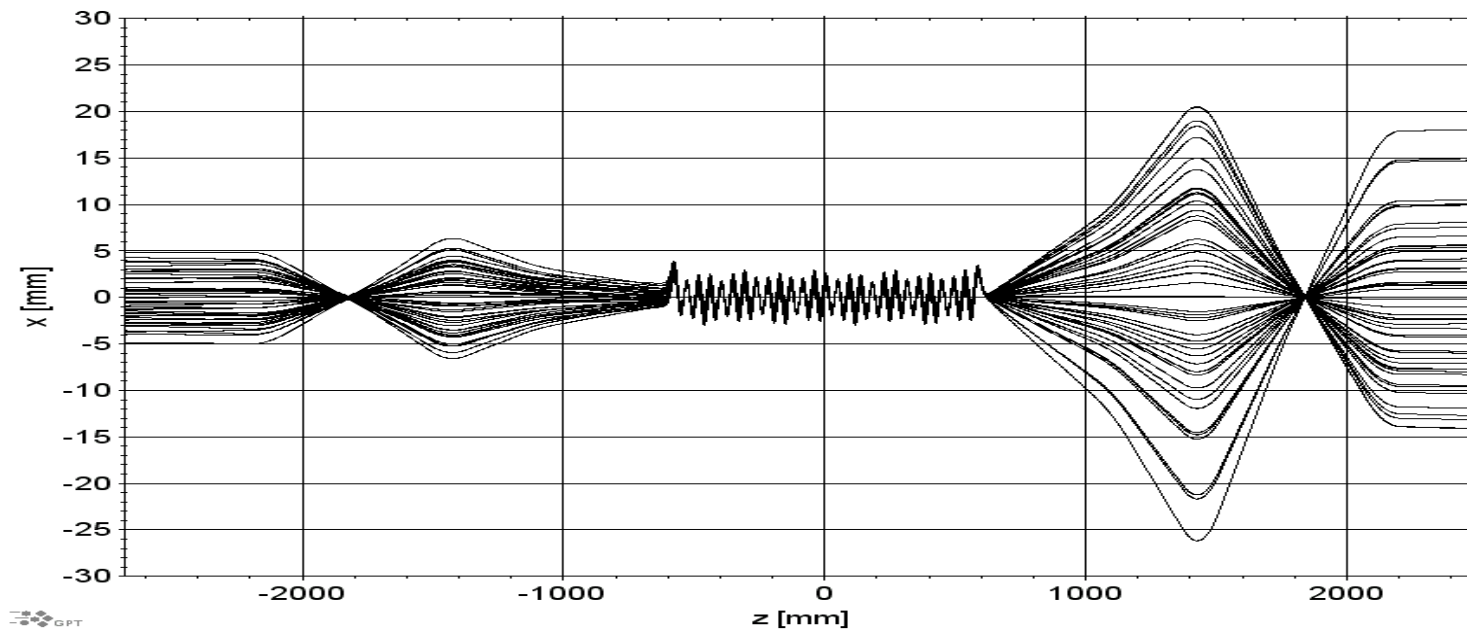
C1, [A]	C2, [A]	C3, [A]	C4, [A]	Beam diameter, Experiment, X [mm]	Beam diameter, Experiment, Y [mm]	Beam diameter, Simulation, X [mm]	Beam diameter, simulation, Y [mm]
-7.6	3.2	3	2	20.5-21	12-12.5	13	13
-7.6	3.2	3.2	2	21-22	18-18.5	17	17
-7.6	3.2	3.5	2	28-29	24-25	27	27
-7.6	3.2	3.6	2	31-32	24.5-25	31	31
-7.6	3.2	3.4	0.8	20-21	20-20.5	22.5	22.5
-7.6	3.2	3.4	1	21.5-22	20.5-21	23	23

Average error X,Y ~ 9%

Beam radius 3 mm, $E=1.4\text{MeV}$ $\varepsilon=3\pi\cdot\text{mm}\cdot\text{mrad}$ 100 electrons
without space-charge



Beam radius 3 mm, $E=1.4\text{MeV}$ $\varepsilon=3\pi\cdot\text{mm}\cdot\text{mrad}$ 100 electrons
with space-charge $I\sim 2\text{A}$



GPT Runs Result at S2 (example)

Q1	Q2	Q3	Q4	Beam Ø Experiment, X [mm]	Beam Ø Simulation, X [mm]	Beam Ø Experiment, Y [mm]	Beam Ø Simulation, Y [mm]
[A]	[A]	[A]	[A]	[mm]	[mm]	[mm]	[mm]
0.405	-0.845	0.66	-0.19	4.41	4.03	8.825	8.73
0.405	-0.845	0.66	-0.19	4.41	3.92	9.07	8.61
0.395	-0.845	0.66	-0.19	4.41	3.37	9.07	9.61
0.395	-0.845	0.66	-0.19	4.41	3.1	10.08	10.15
0.395	-0.845	0.66	-0.19	4.41	3.43	10.08	10.23
0.415	-0.845	0.66	-0.19	6.3	4.8	7.56	7.83
0.415	-0.845	0.66	-0.19	6.3	5.05	8.06	8.1
0.415	-0.845	0.66	-0.19	6.3	4.87	7.56	8.14
0.405	-0.845	0.66	-0.19	3.78	4.04	7.305	9.07
0.405	-0.845	0.66	-0.19	3.78	3.96	7.05	9.32
0.405	-0.855	0.66	-0.19	3.15	3.33	7.56	10.53
0.405	-0.855	0.66	-0.19	3.15	3.66	9.07	11.07
0.405	-0.855	0.66	-0.19	3.15	3.34	8.06	11.18

Average error X,Y ~ 12%