A Capture Section scheme for the ILC Positron Source (Alternative Solution)

by
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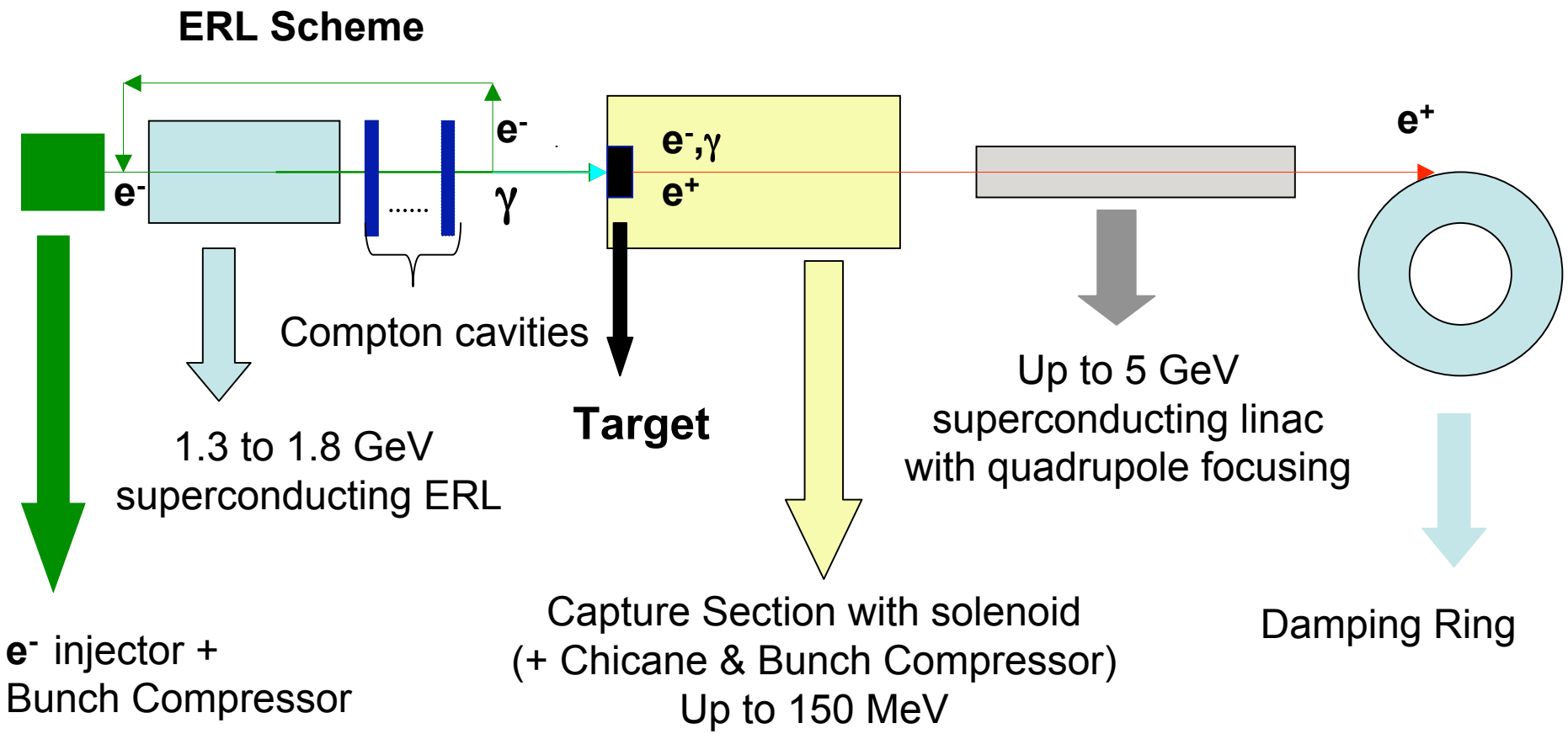
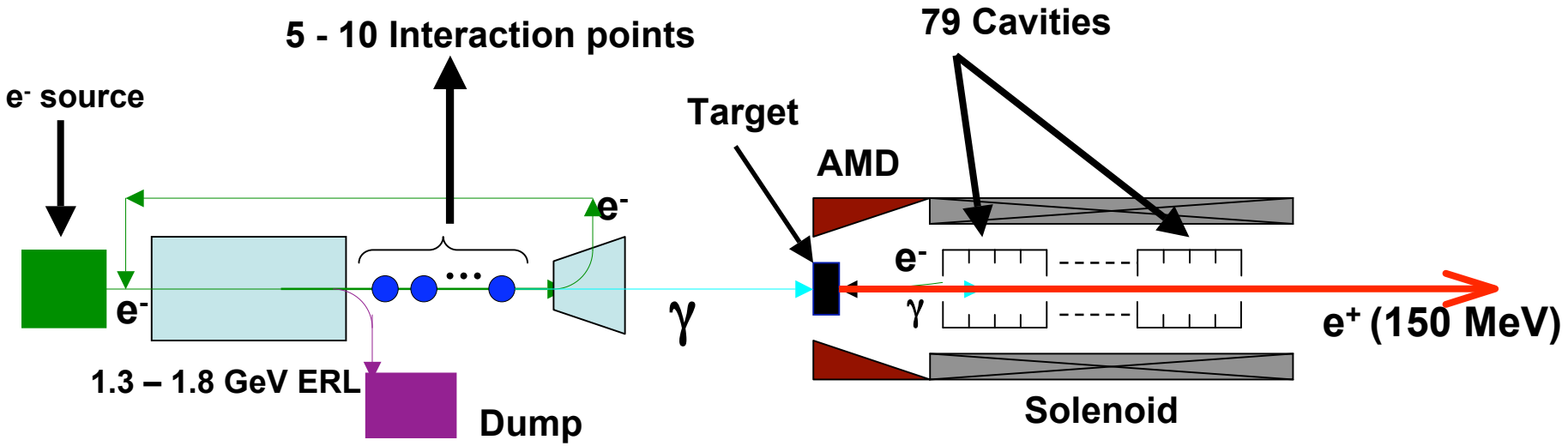
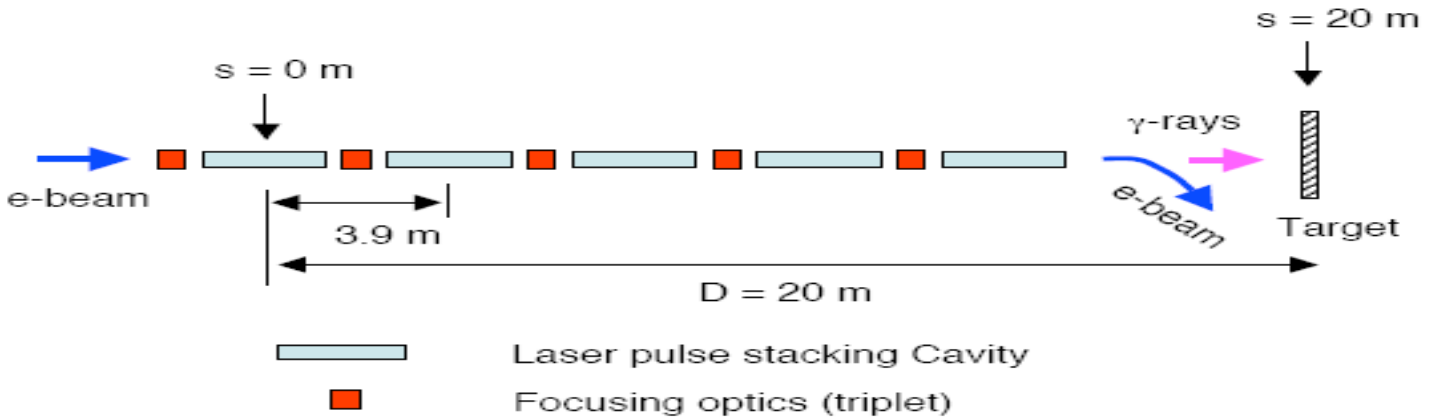
Positron Source

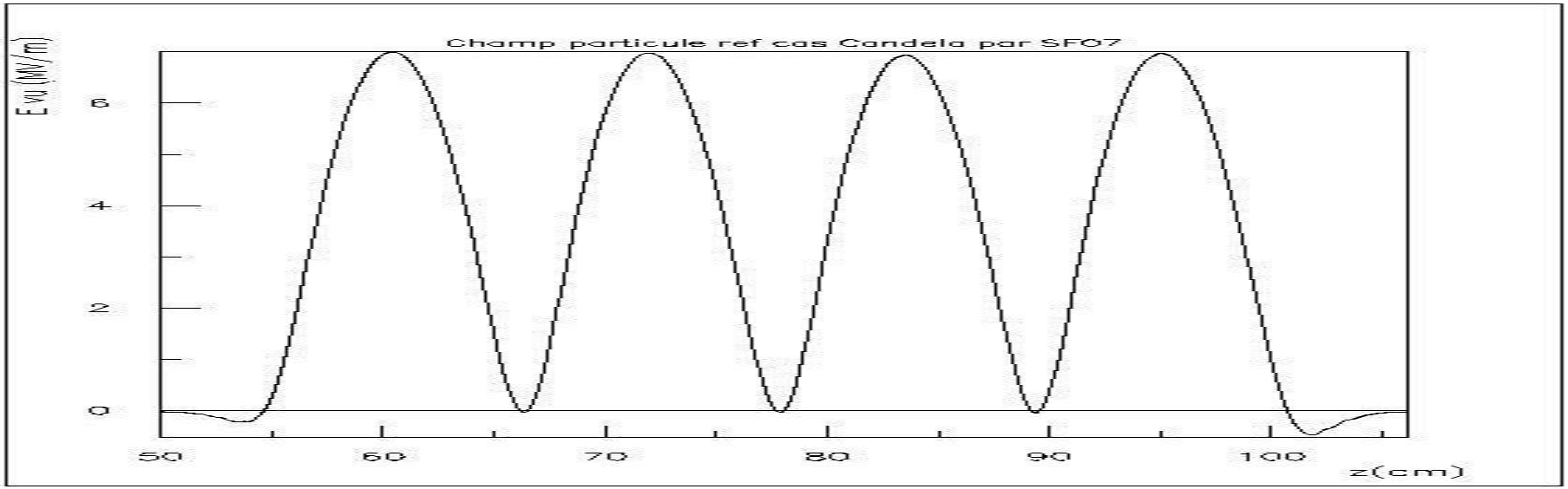


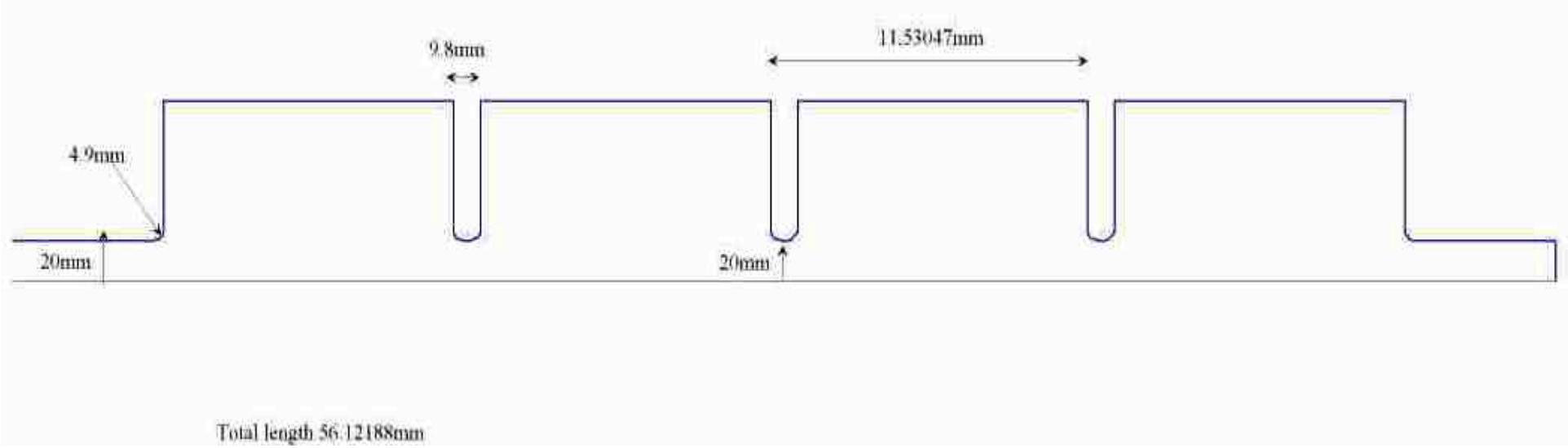
Scheme of the Capture Section (up to 150 MeV)



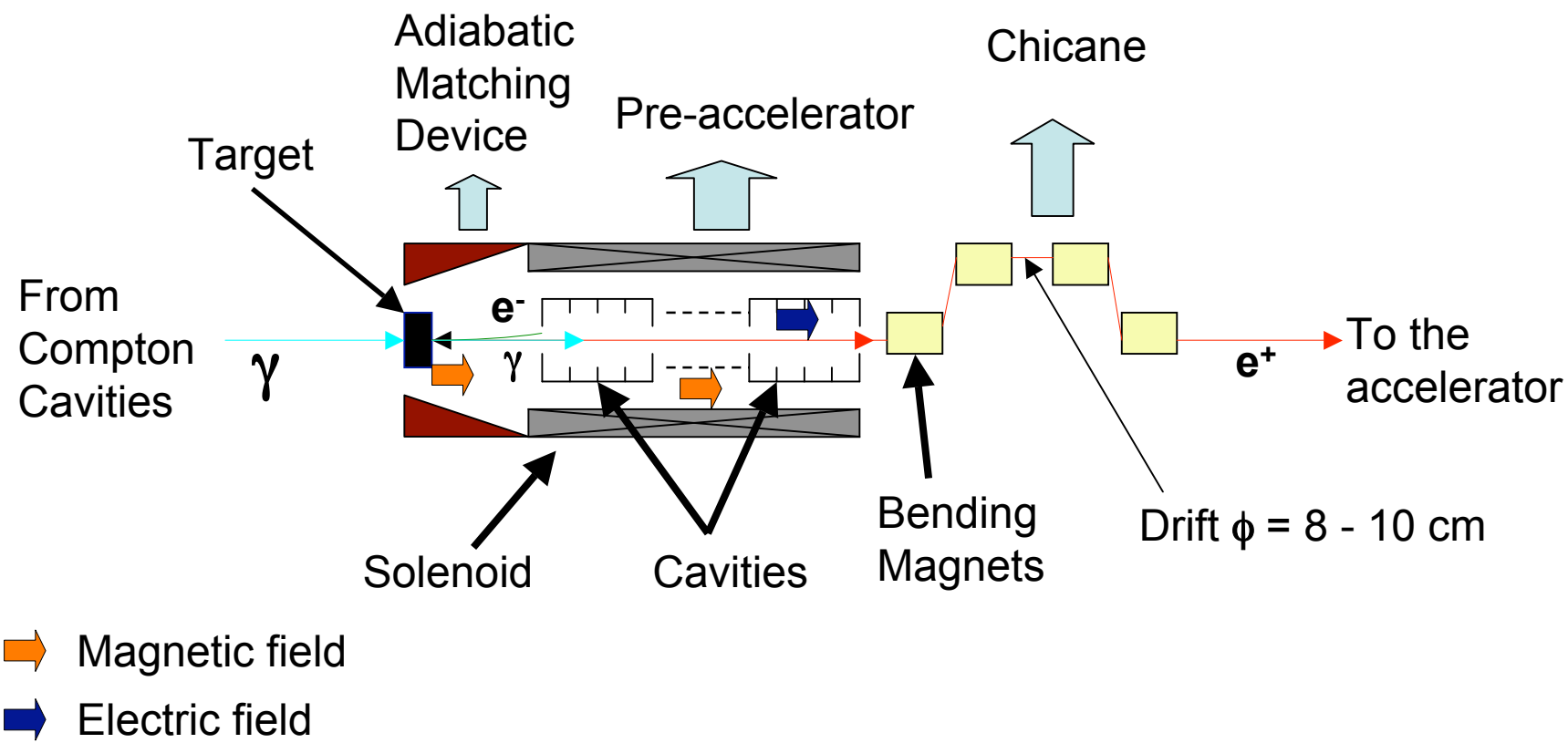


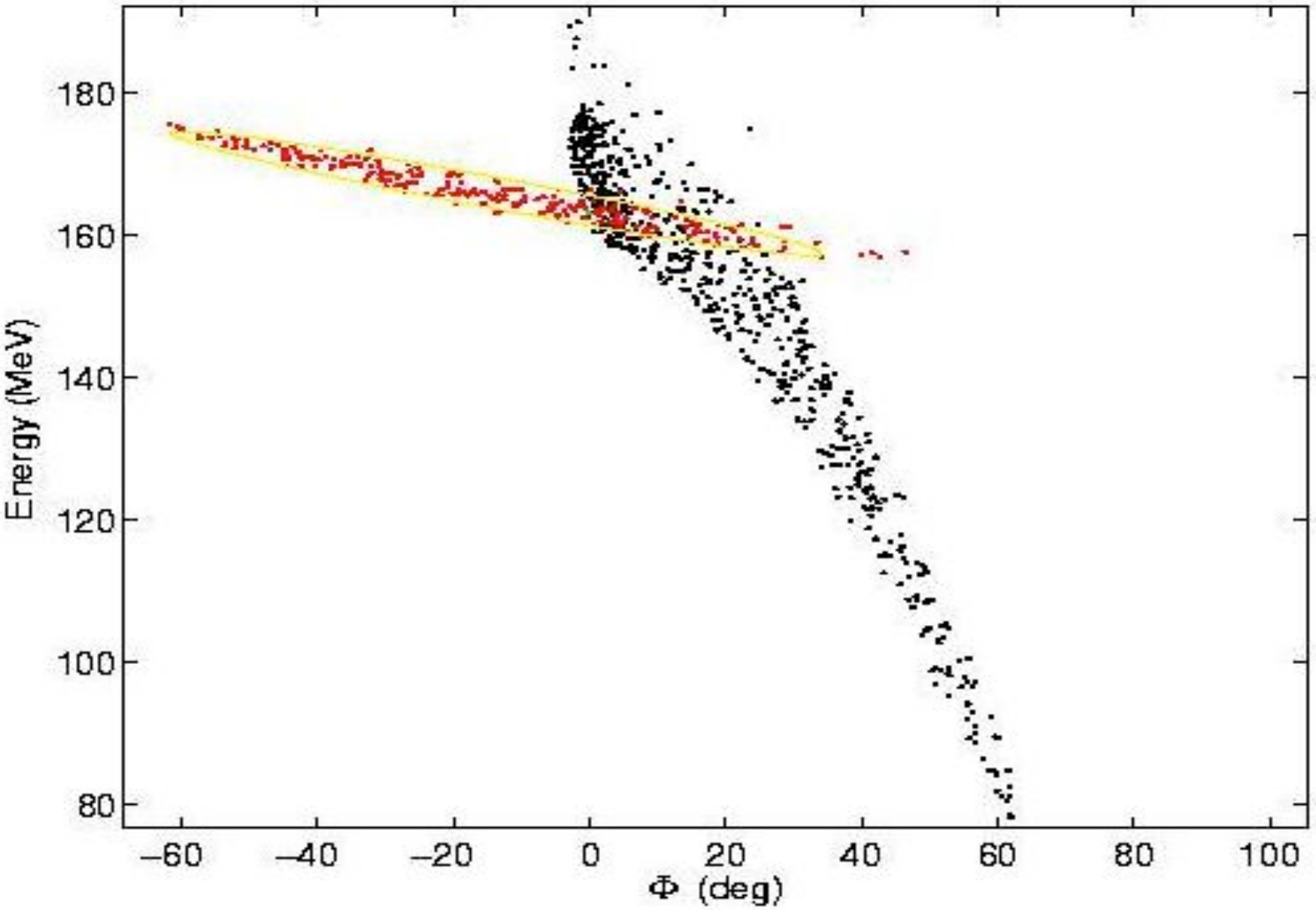
New Cavity (1.3 GHz, SW, 100 KW CW)



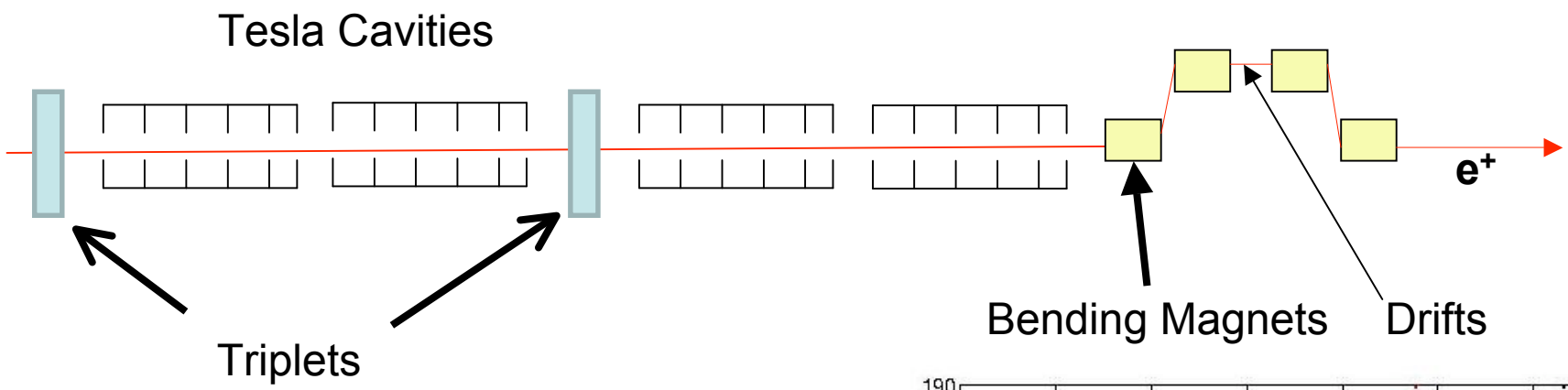


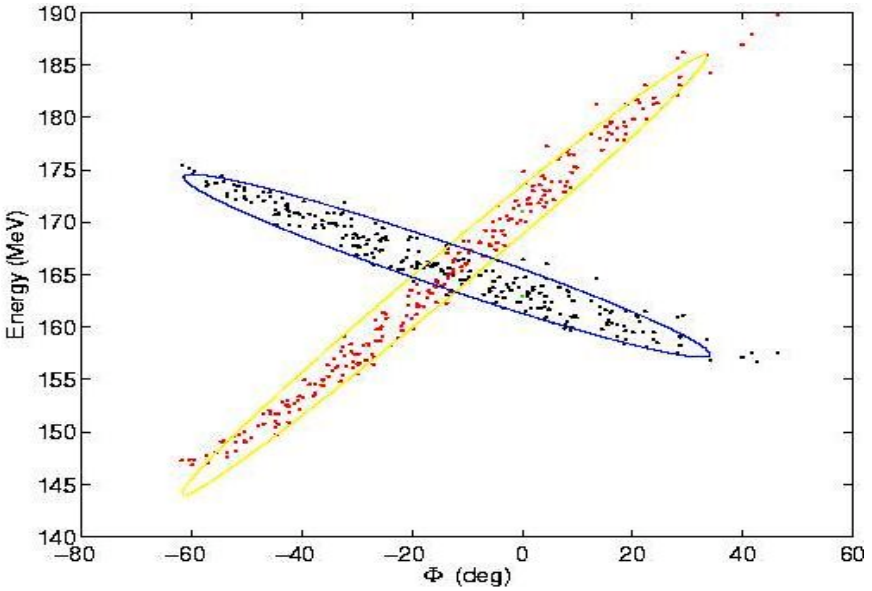
Capture Section (+ CHICANE)

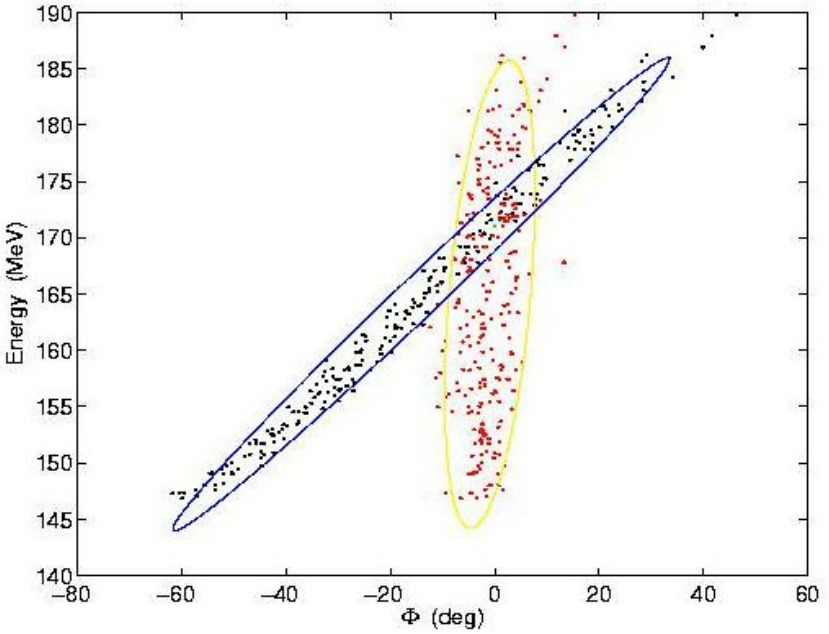



180
160
140
120
100
80
Energy (MeV)
−60
−40
−20
0
20
40
60
80
100
Φ (deg)

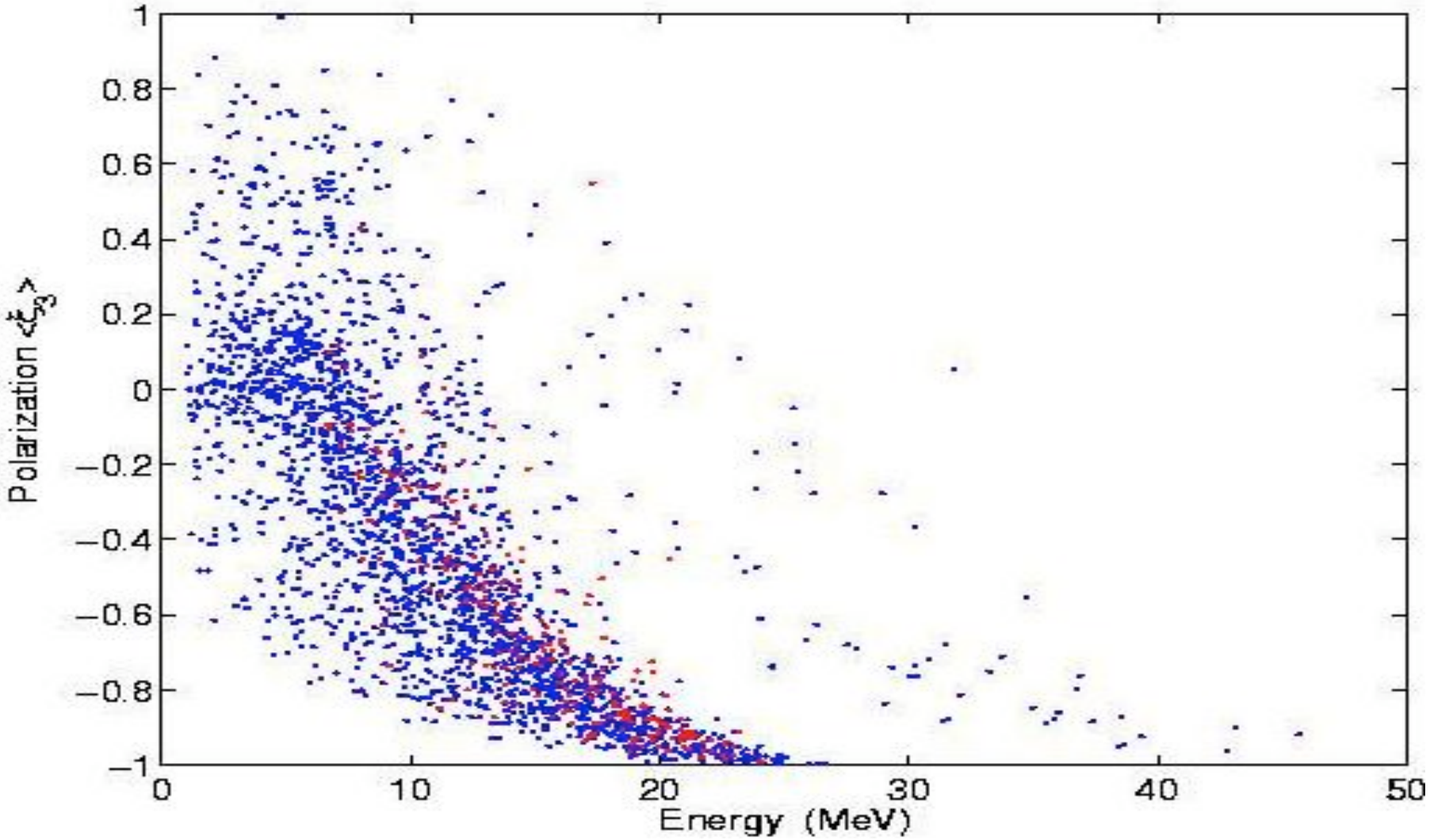
Bunch Compressor







Polarization (61.5%)



Results I

Type	Yield e^+/γ %	ε_x π mm mrad	ε_y π mm mrad	ε_z π cm MeV	σ_z cm	σ_E MeV	σ_x cm	σ_y cm	$\sigma_{\theta x}$ mrad	$\sigma_{\theta y}$ mrad
1.3 / 5	0.36	15	17	1.53	1.67	3.55	2.06	0.86	2.7	2.2
1.3 / 5 B. C. (0.3X0)	0.40	16	15	2.64	0.28	9.99	0.68	0.94	3.4	1.7
1.3 / 5 B. C. (0.4X0)	0.36	13	14	2.74	0.28	10.64	0.62	0.86	3.3	1.7
1.3 / 5 B. C. (0.5X0)	0.40	16	17	2.91	0.28	10.92	0.66	0.96	3.5	1.8
1.8 / 5	0.88	19	19	2.15	1.85	5.6	2.28	1.04	2.9	1.9
1.8 / 5 B. C. 1	0.90	17	15	3.89	0.32	12.71	0.63	0.70	2.9	2.2
1.8 / 5 B. C. 2	0.81	14	15	2.51	0.97	5.06	2.50	0.51	3.7	3.2

Results II

Type	N. γ	Yield e^+/γ %	N. e^+	ε_z π cm MeV	N. e^+ / 4 π ε_z e^+ / (cm MeV)
1.3 / 5	0.67 10^{10}	0.36	2.39 10^7	1.53	1.13 10^6
1.3 / 5 B. C. (0.3 X0)	0.67 10^{10}	0.40	2.66 10^7	2.64	7.24 10^5
1.3 / 5 B. C. (0.4 X0)	0.67 10^{10}	0.36	2.42 10^7	2.74	6.43 10^5
1.3 / 5 B. C. (0.5 X0)	0.67 10^{10}	0.40	2.69 10^7	2.91	6.81 10^5
1.8 / 5	0.75 10^{10}	0.88	6.65 10^7	2.15	2.19 10^6
1.8 / 5 B. C. 1	0.75 10^{10}	0.90	6.78 10^7	3.89	1.23 10^6
1.8 / 5 B. C. 2	0.75 10^{10}	0.81	6.08 10^7	2.51	1.73 10^6