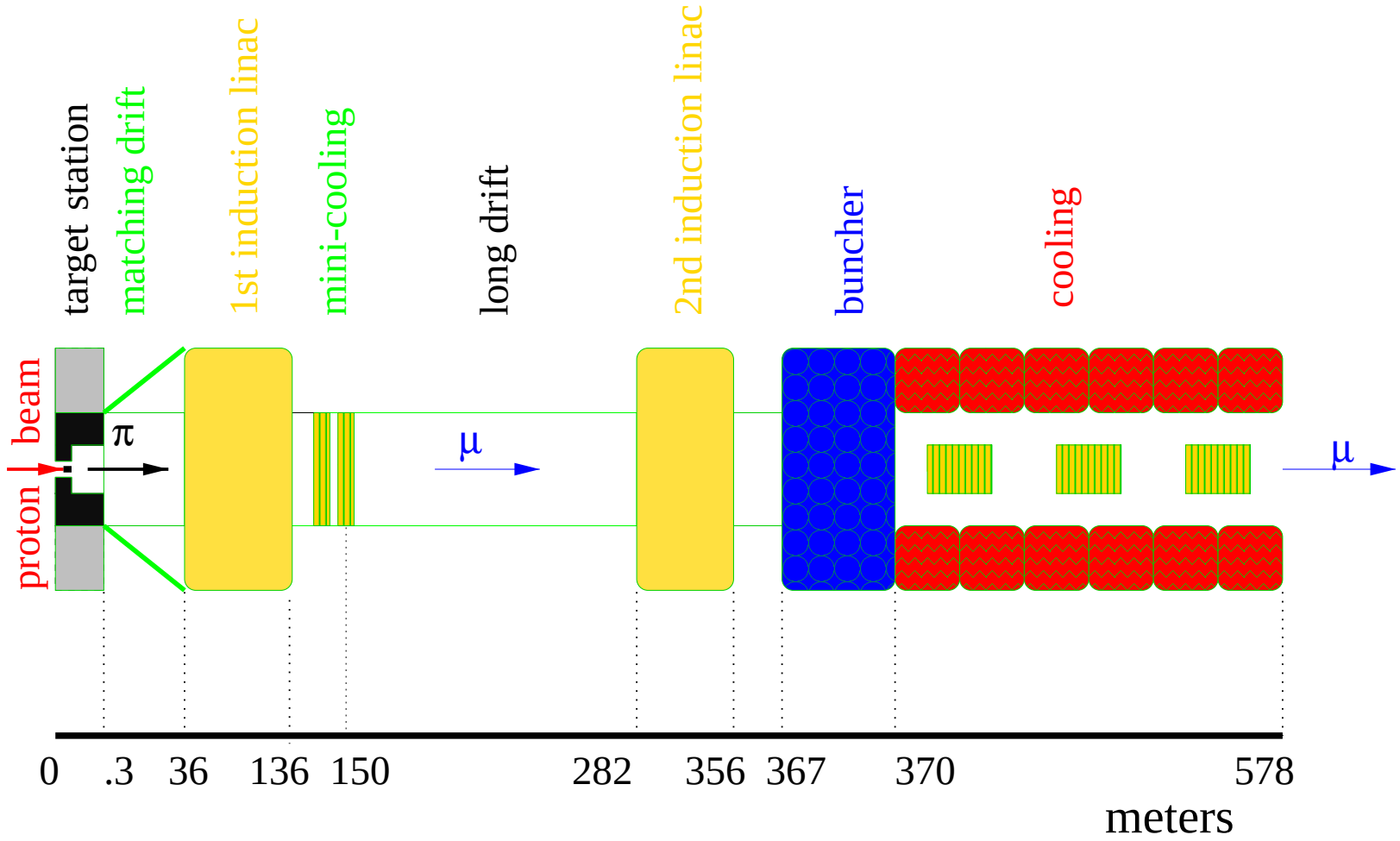

proton beam
target station
matching drift
1st induction linac
mini-cooling
long drift
2nd induction linac
buncher
cooling
π
μ
μ
0
.3
36
136
150
282
356
367
370
578
meters

Mars Simulation Results

1cm diameter, 30cm long Hg Target

Tablular protons are secondary protons only

Particles at Z=0 cm and $p_t < 0.5$ GeV/c

	Particles/Incoming protons				
	e	μ	π	K	p
positives	0.70	0.02	1.78	0.07	0.70
negatives	1.22	0.02	1.59	0.04	-

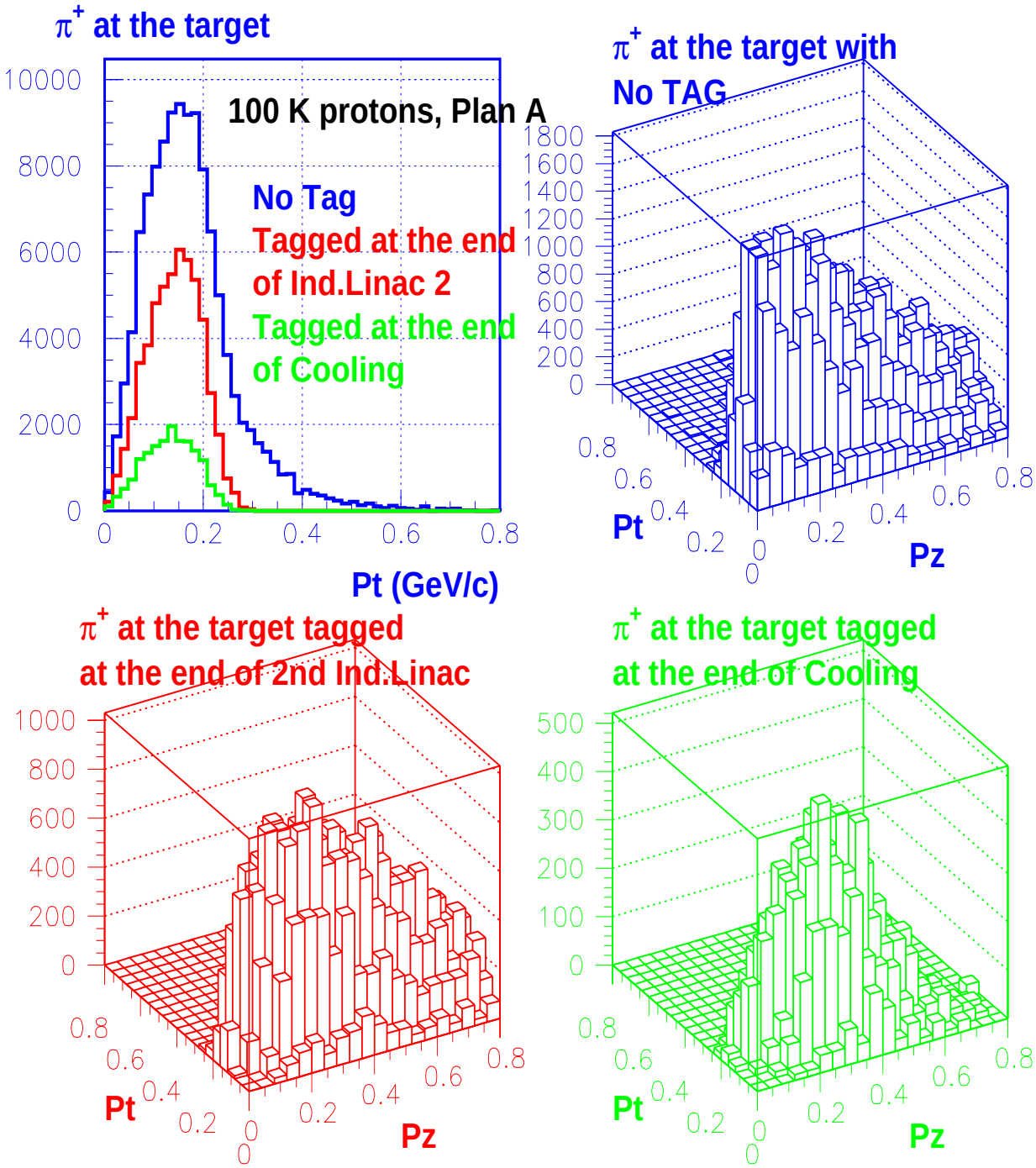
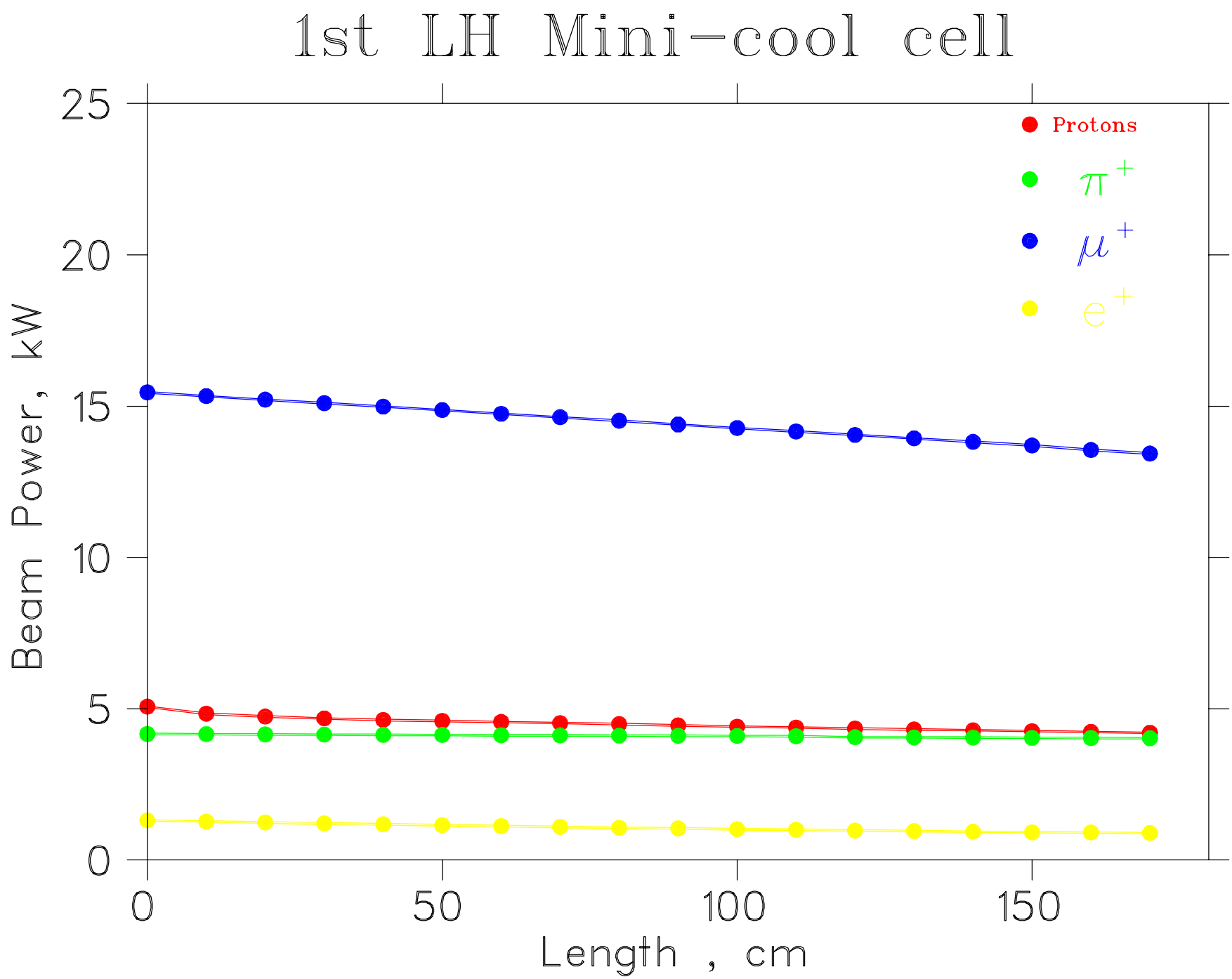


Figure 5: p_t spectra of π^+s at the target with/without taggs by the μ^+s at the end of 2nd Induction linac and at the end of the cooling channel


1st LH Mini-cool cell
Protons
π^+
μ^+
e^+
Beam Power, kW
Length , cm
0
5
10
15
20
25
0
50
100
150

ICOOL Simulation Results

Induction Linac Phase Rotation

Power dissipated in 1st mini-cool LH cell

Positive muon collection

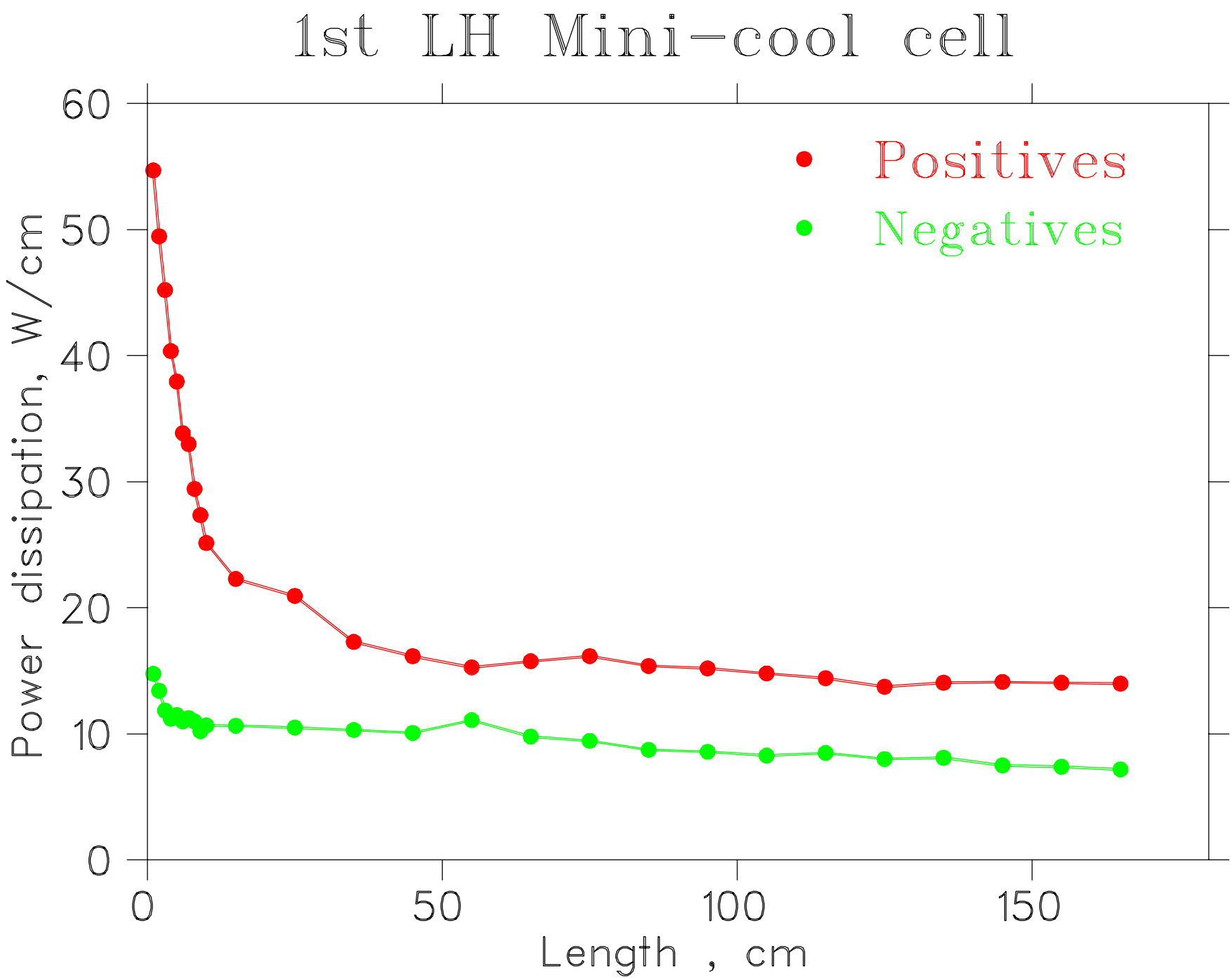
	Power, KW				
	e	μ	π	K	p
positives	0.42	2.02	0.14	0	0.86
negatives	0.43	1.29	0.24	0	-

Total Power dissipated = 5.4 KW

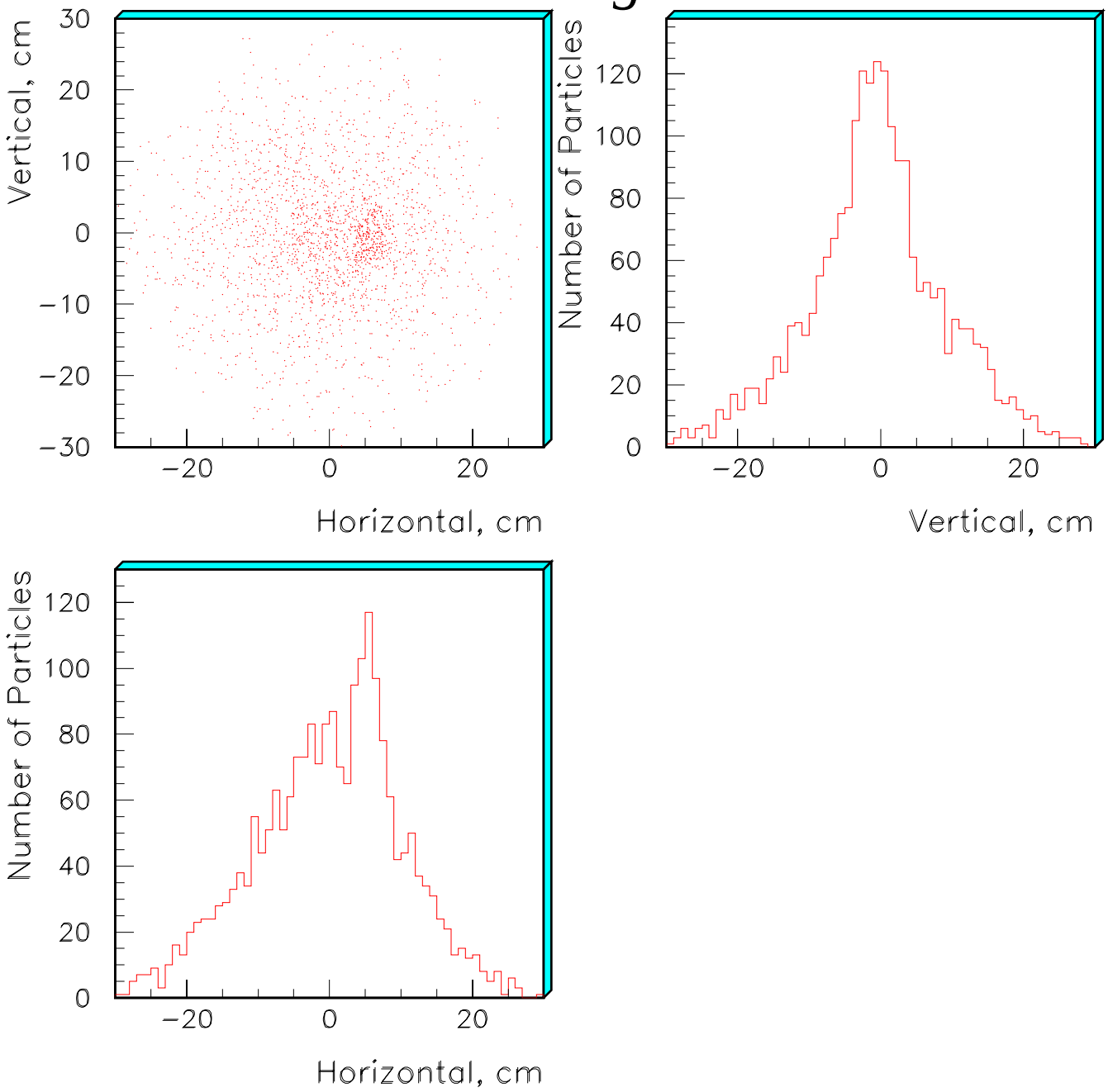
Negative muon collection

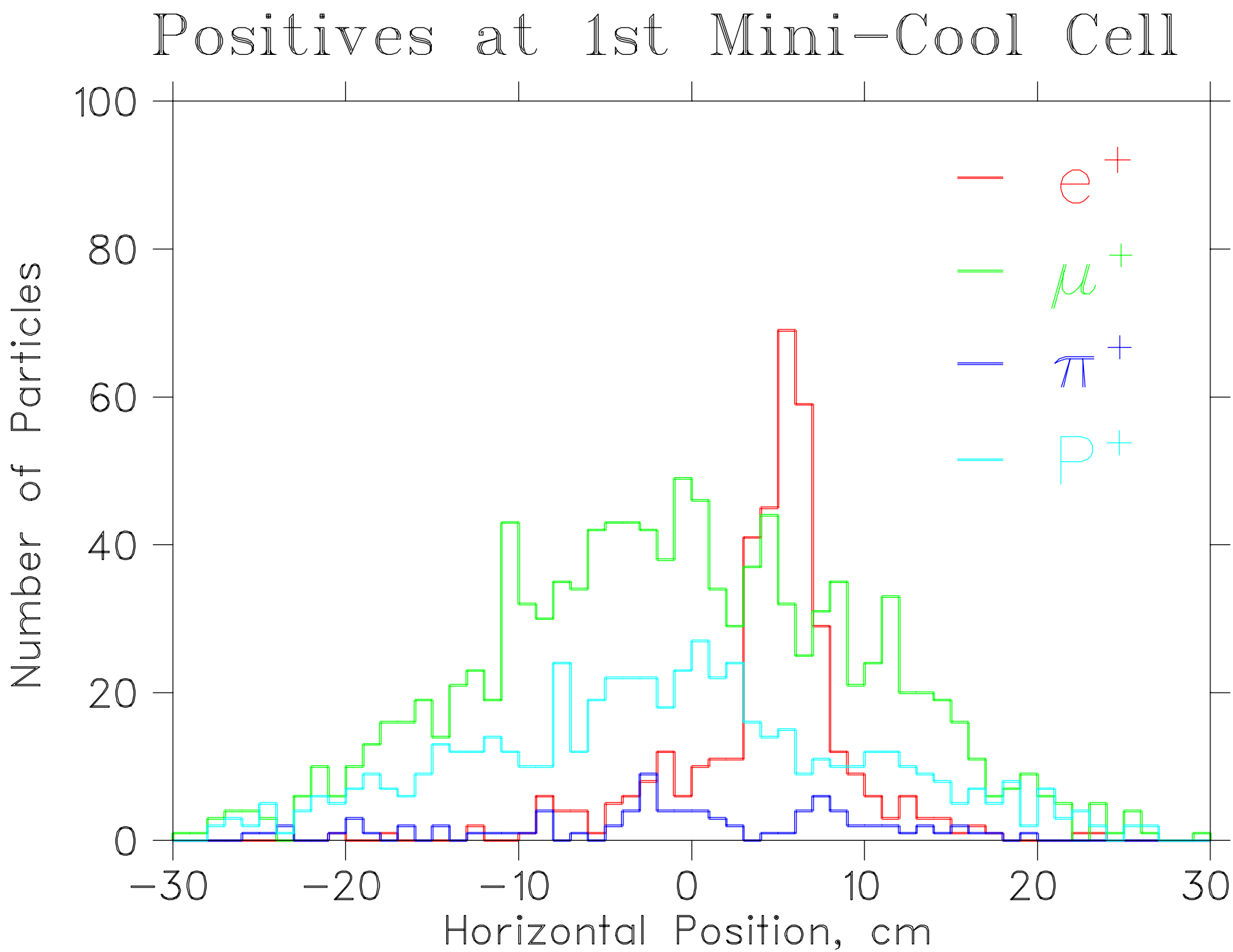
	Power, KW				
	e	μ	π	K	p
positives	0.42	1.45	0.19	0	0.94
negatives	0.45	1.90	0.14	0	-

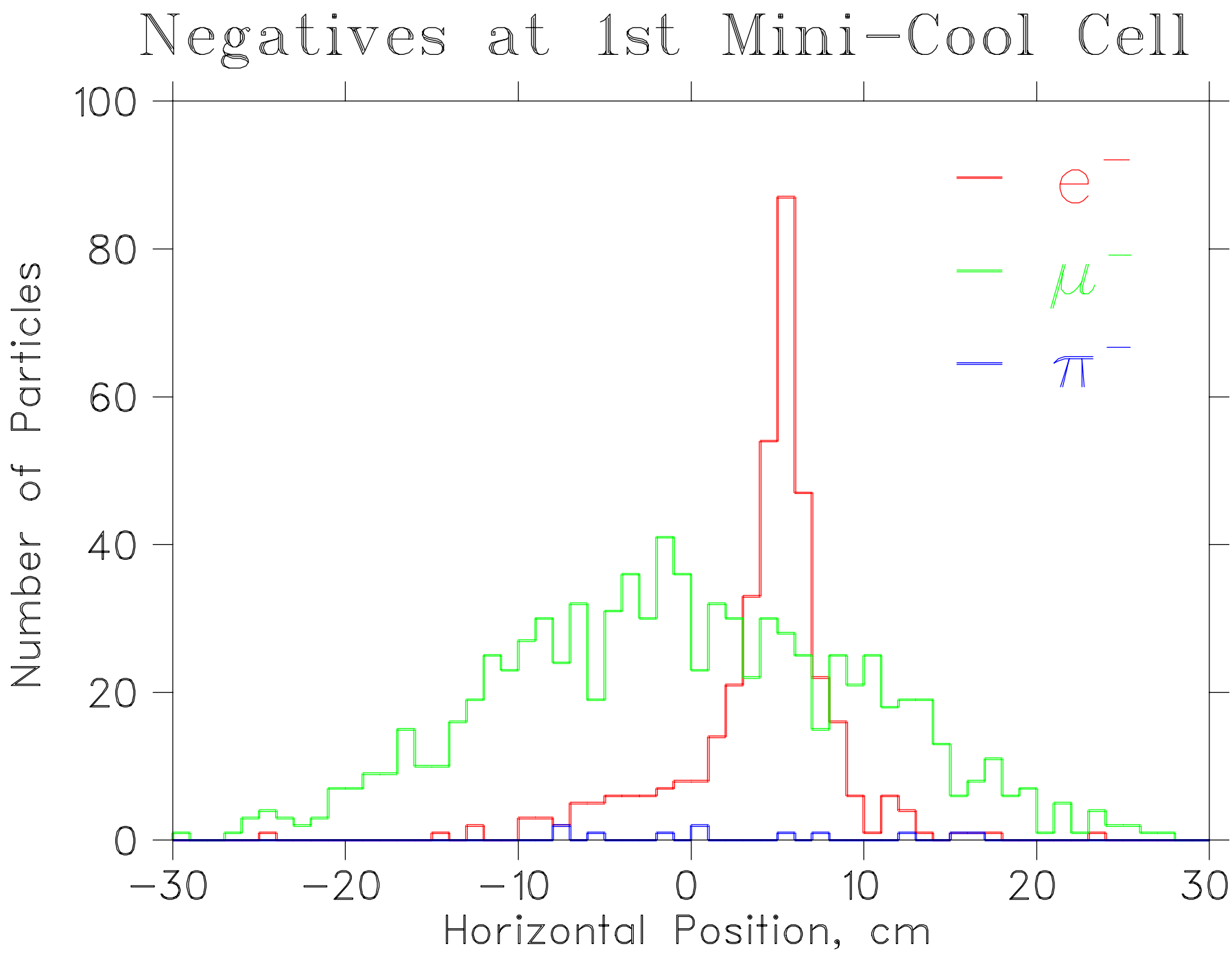
Total Power dissipated = 5.5 KW


1st LH Mini-cool cell
Positives
Negatives
Power dissipation, W/cm
Length , cm
0
10
20
30
40
50
60
0
50
100
150

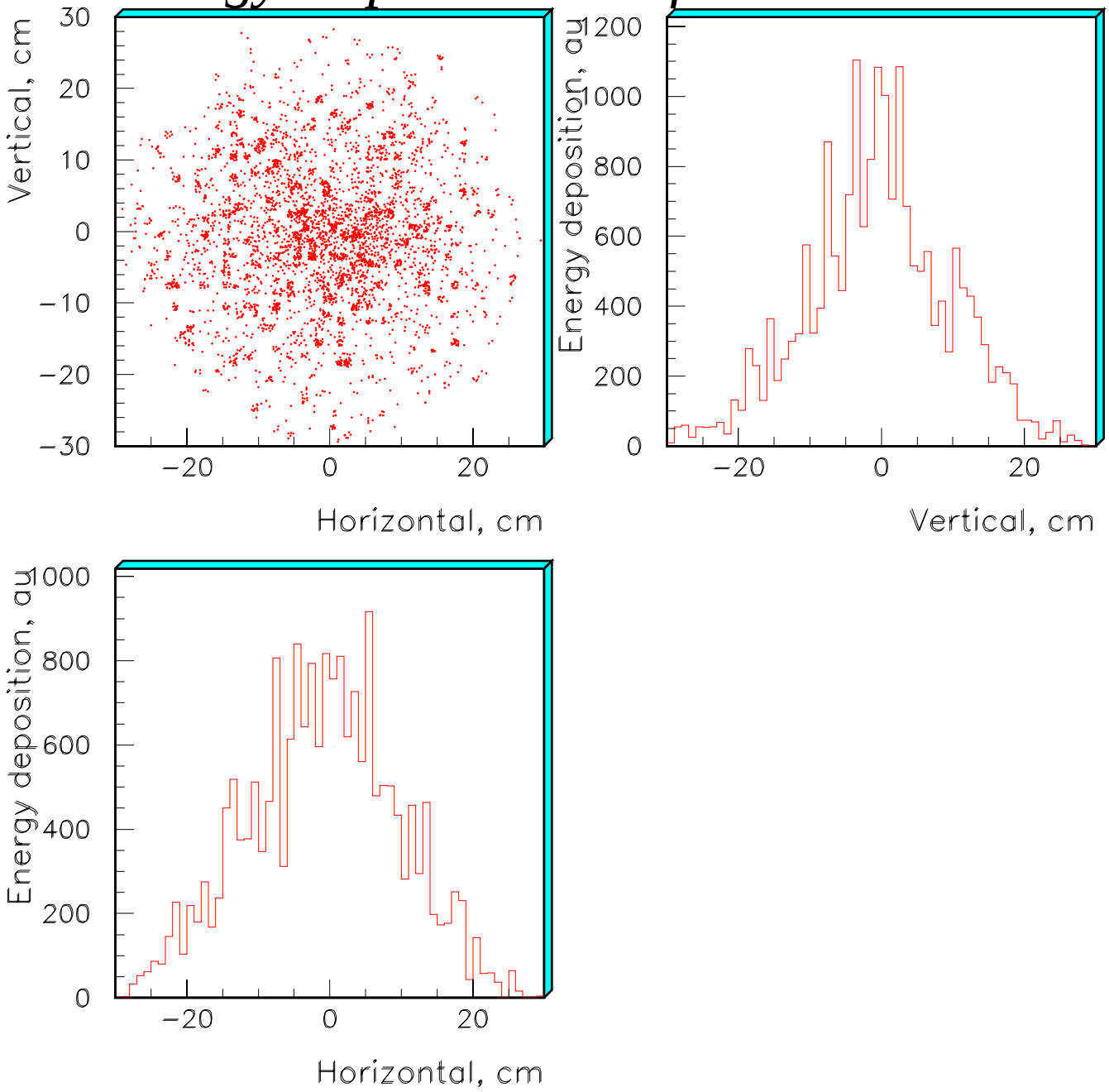
Positives arriving at 1st LH Cell




Positives at 1st Mini-Cool Cell
Number of Particles
Horizontal Position, cm
100
80
60
40
20
0
−30
−20
−10
0
10
20
30
e+
μ+
π+
p+


Negatives at 1st Mini-Cool Cell
Number of Particles
Horizontal Position, cm
100
80
60
40
20
0
−30
−20
−10
0
10
20
30
e^-
μ^-
π^-

Energy Deposition Profile at 1st LH Cell



Temperature rises in Mini-cool cells

Specific Heat LH: 14.2 J/gC

Energy deposition cell entrance = 69.5 J/cm/sec

Energy deposition cell exit = 21.2 J/cm/sec

15% of power is within the r=5cm core

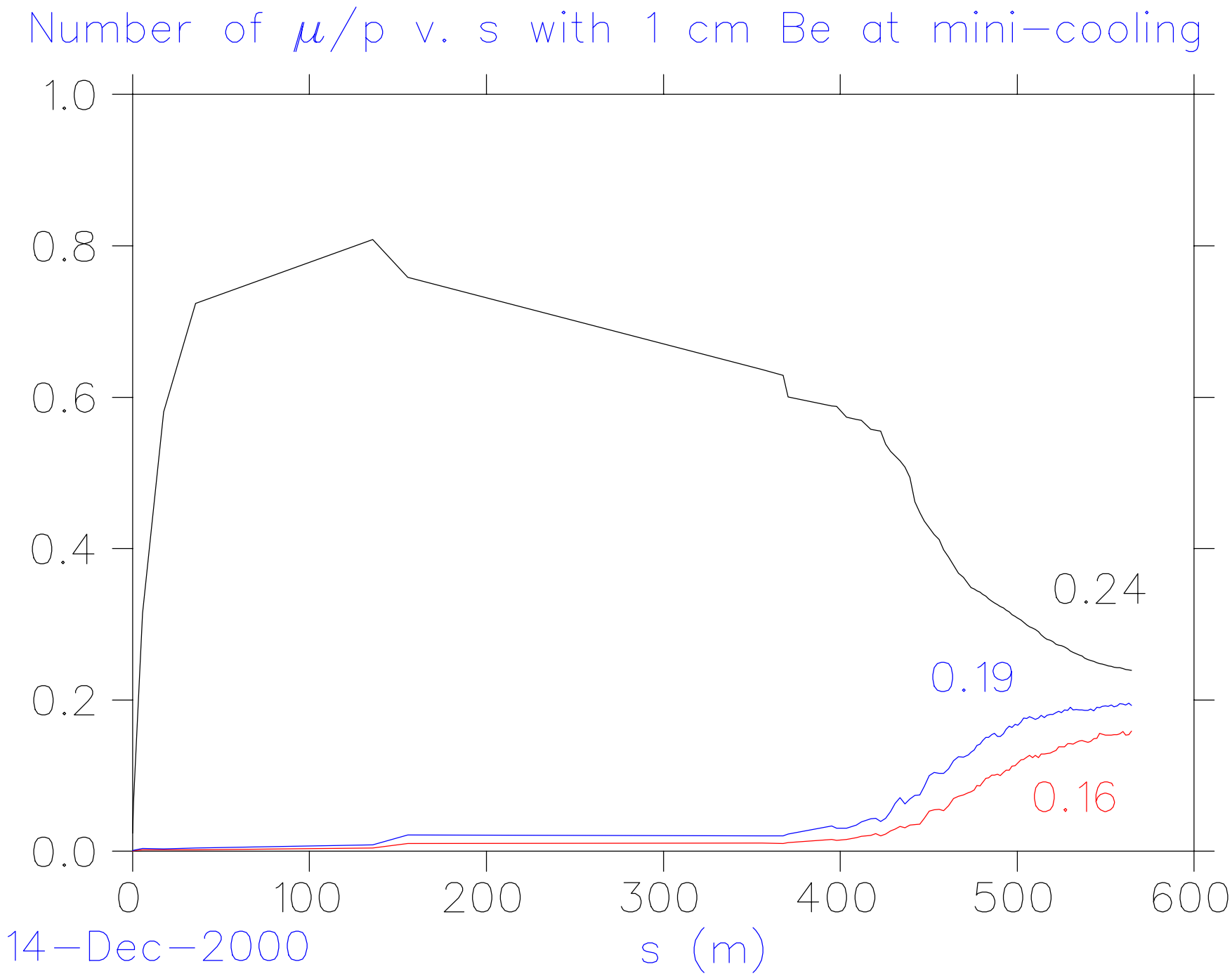
Therefore:

Temperature rise cell entrance core

0.13°/sec

Temperature rise cell exit core

0.04°/sec


Number of μ/p v. s with 1 cm Be at mini−cooling
1.0
0.8
0.6
0.4
0.2
0.0
0
100
200
300
400
500
600
0.24
0.19
0.16
14−Dec−2000
s (m)