fo3c2:
new run of a 175 MHz, 3T super fofo solution that runs on icool 1.94

data, output data, td and tex files are on:
http://pubweb.bnl.gov/people/palmer/cool/fo3c2

If you are wondering about fo3ct:
fo means fofo
3 is for 3 T
c is for cool (n for no acc & no mat, m for matching)
2 is second soluton

The rf is pillbox with Be foils
Frequency of 175 MHz
Average acceleration on axis is 15 MV/m

This run is designed as a first stage of cooling after a second bunch rotation and rebunching into 30 sub-bunches.

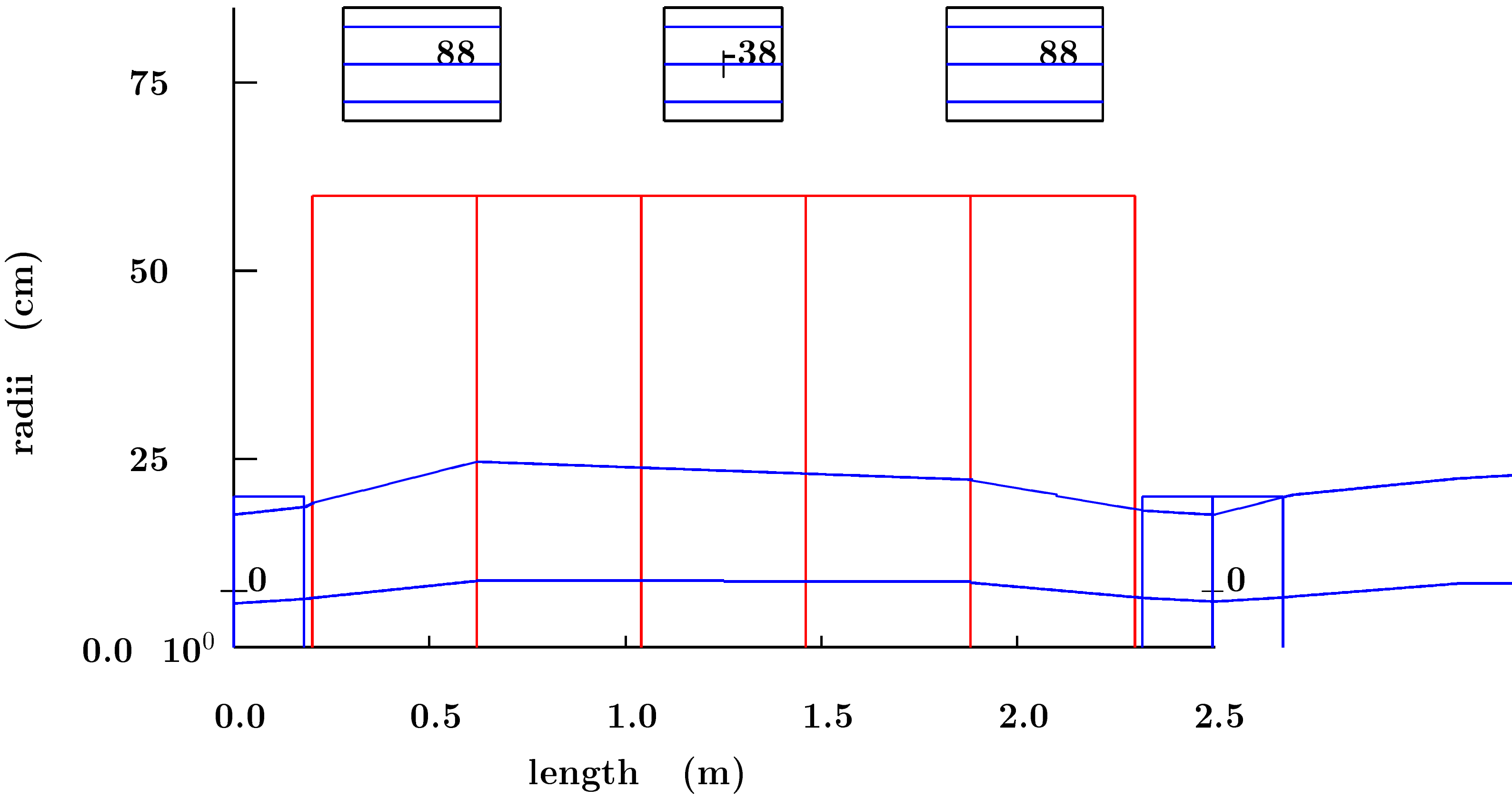
The length is 75 m. The initial and final conditions are:

transverse emittance	9-3 pi mm
longitudinal emittance	13-24 mm
6D emittance	1-.2 $(10^{-6} \quad \pi^3 \ m^3)$
rms dp/p	8-11 %
rms ct	9-13 cm

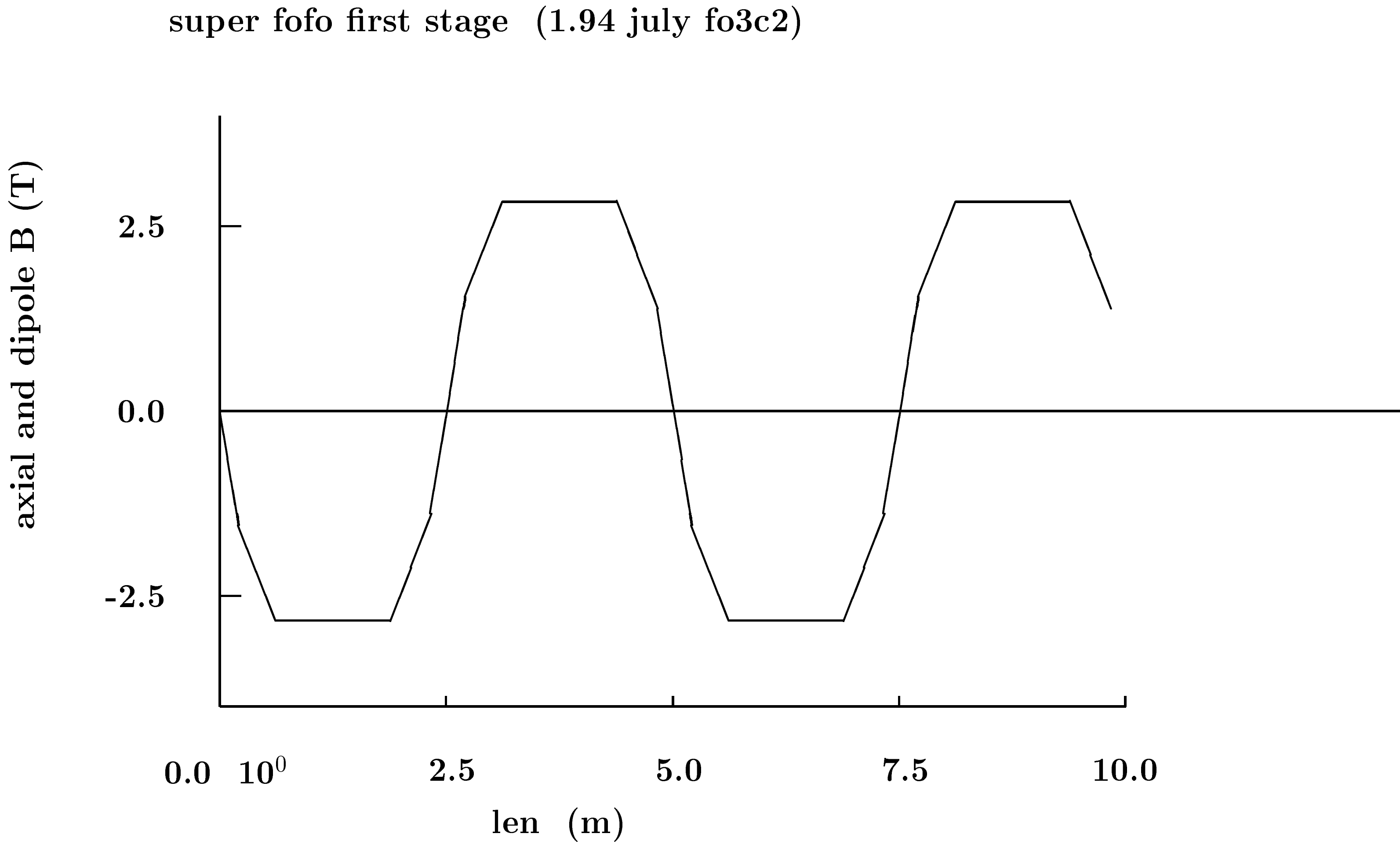
In this simulation the lattice is kept the same for the full 75 m. It is seen that the rate of cooling drops after about 50 m. clearly the lattice should be modified to redce the beta. This should be done adiabatically to avoid the discontinuities in the required amplitude-momentum correlation.

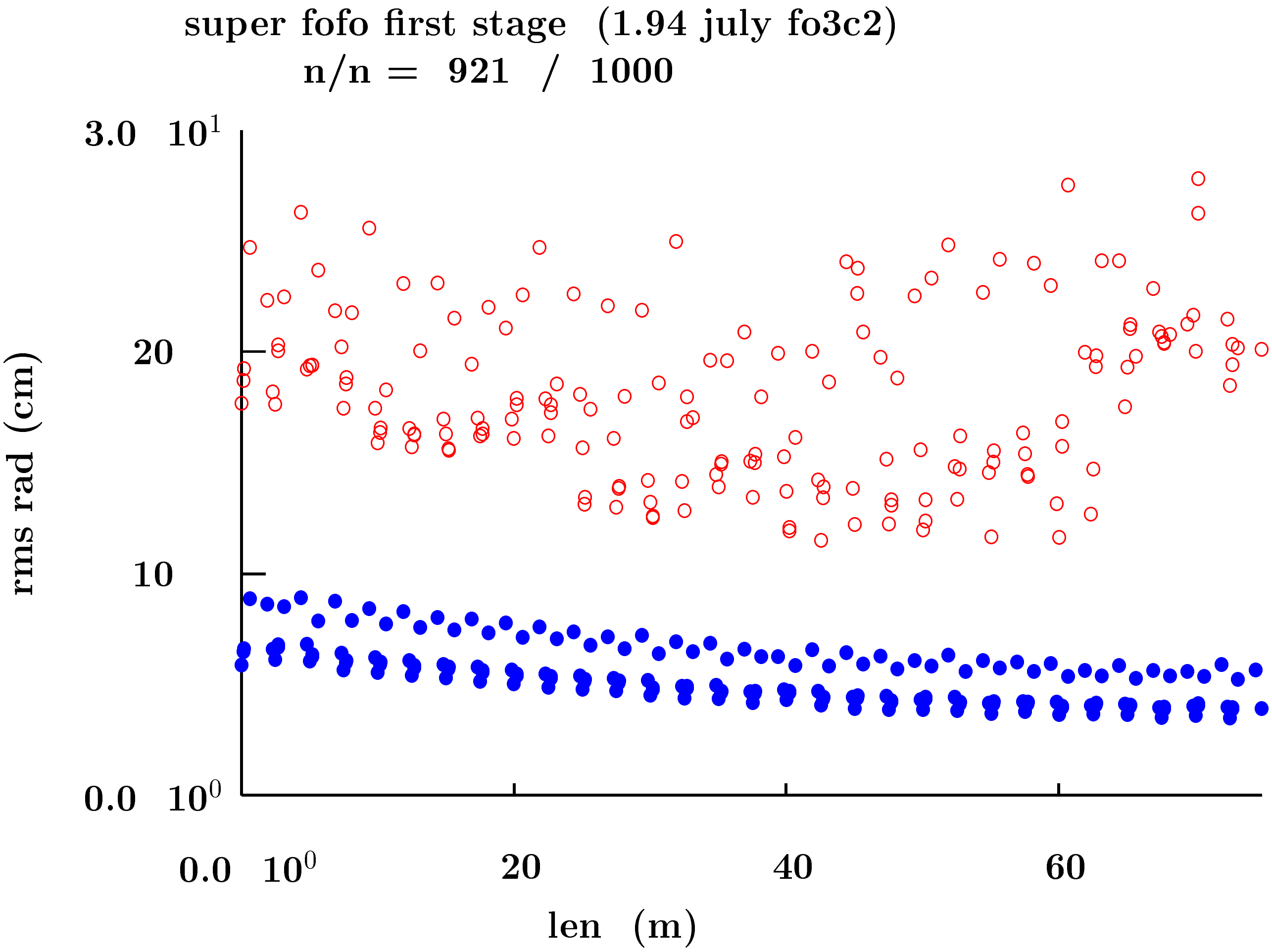
Length of cell=2.5m. Coil Blocks:

start	dl	rad	dr		I/A
m	m	m	m		A/mm^2
0.280	0.400	0.700	0.150	3	88.48
1.100	0.300	0.700	0.150	3	-38.21
1.820	0.400	0.700	0.150	3	88.48

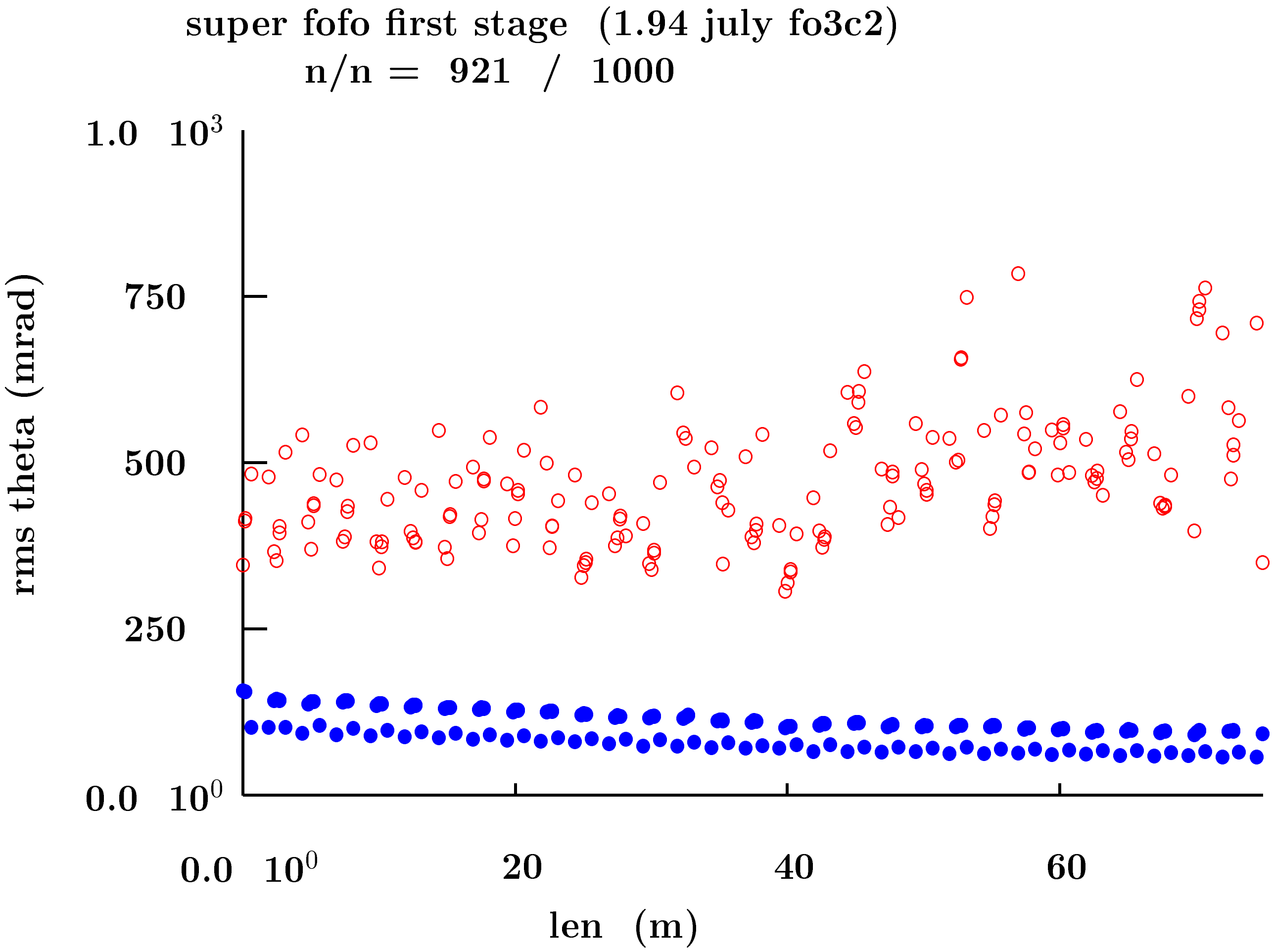


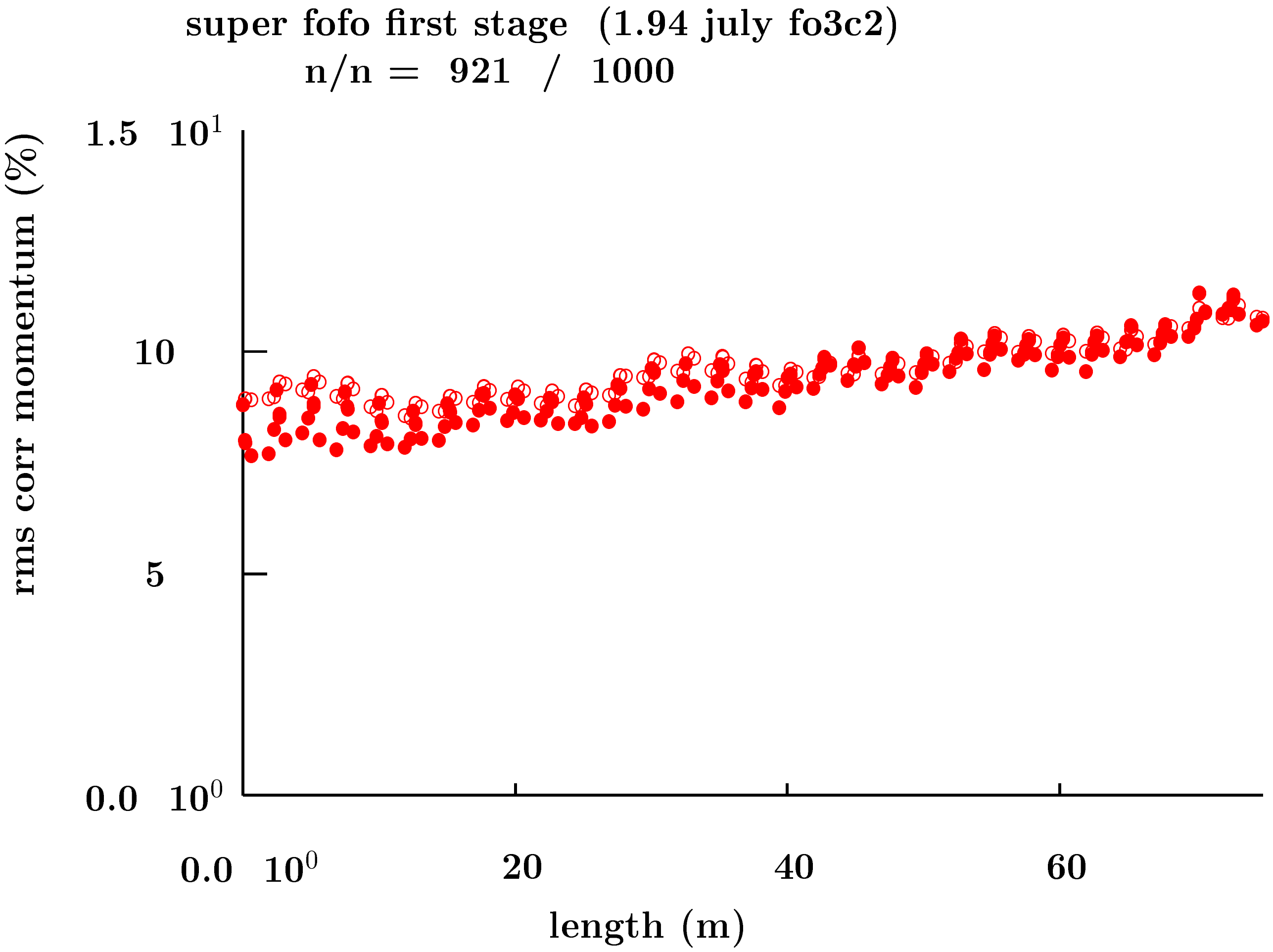
88
-38
88
75
50
25
0
0
0.0
10^0
radii (cm)
0.0
0.5
1.0
1.5
2.0
2.5
length (m)


super fofo first stage (1.94 july fo3c2)
axial and dipole B (T)
2.5
0.0
-2.5
0.0 10^0
2.5
5.0
7.5
10.0
len (m)

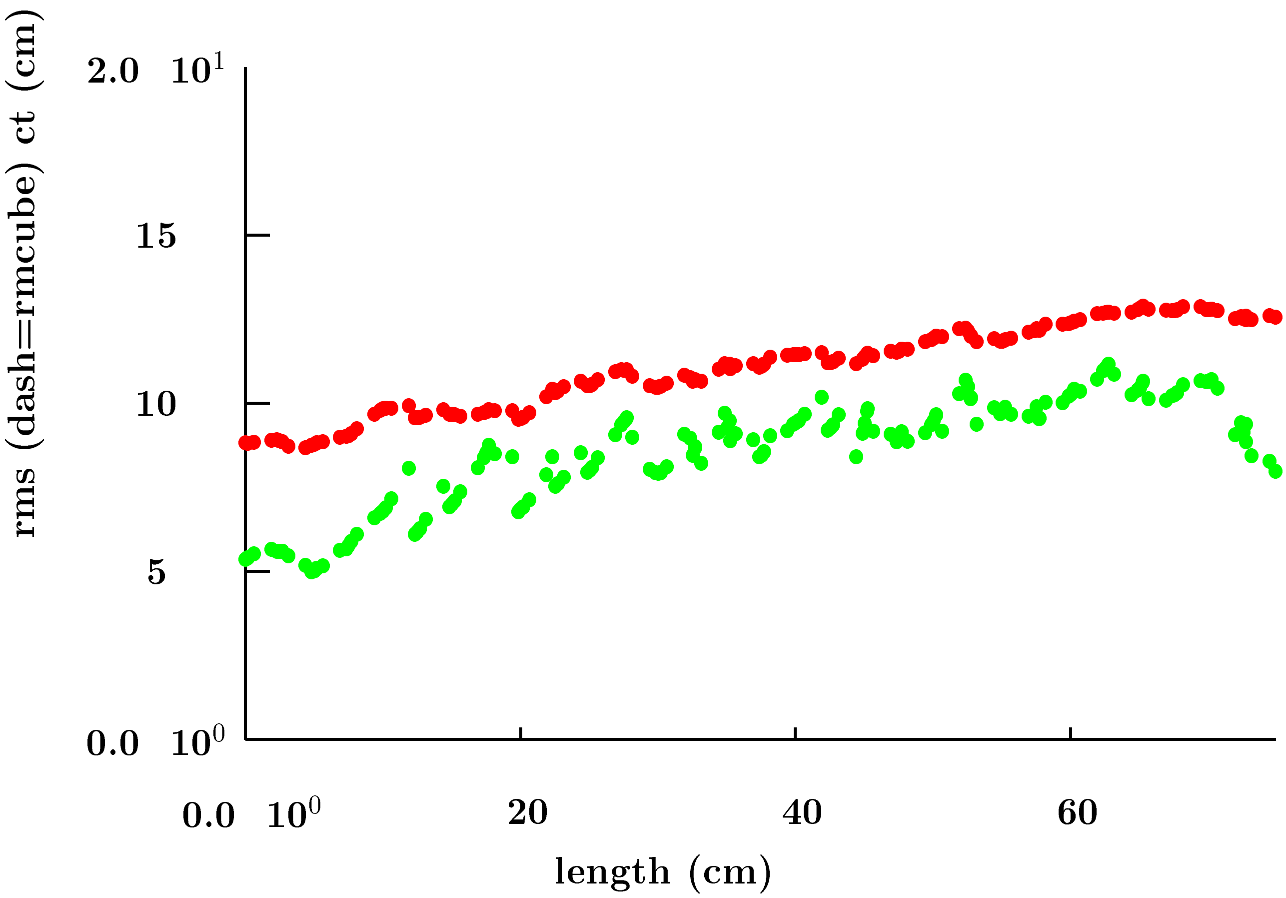


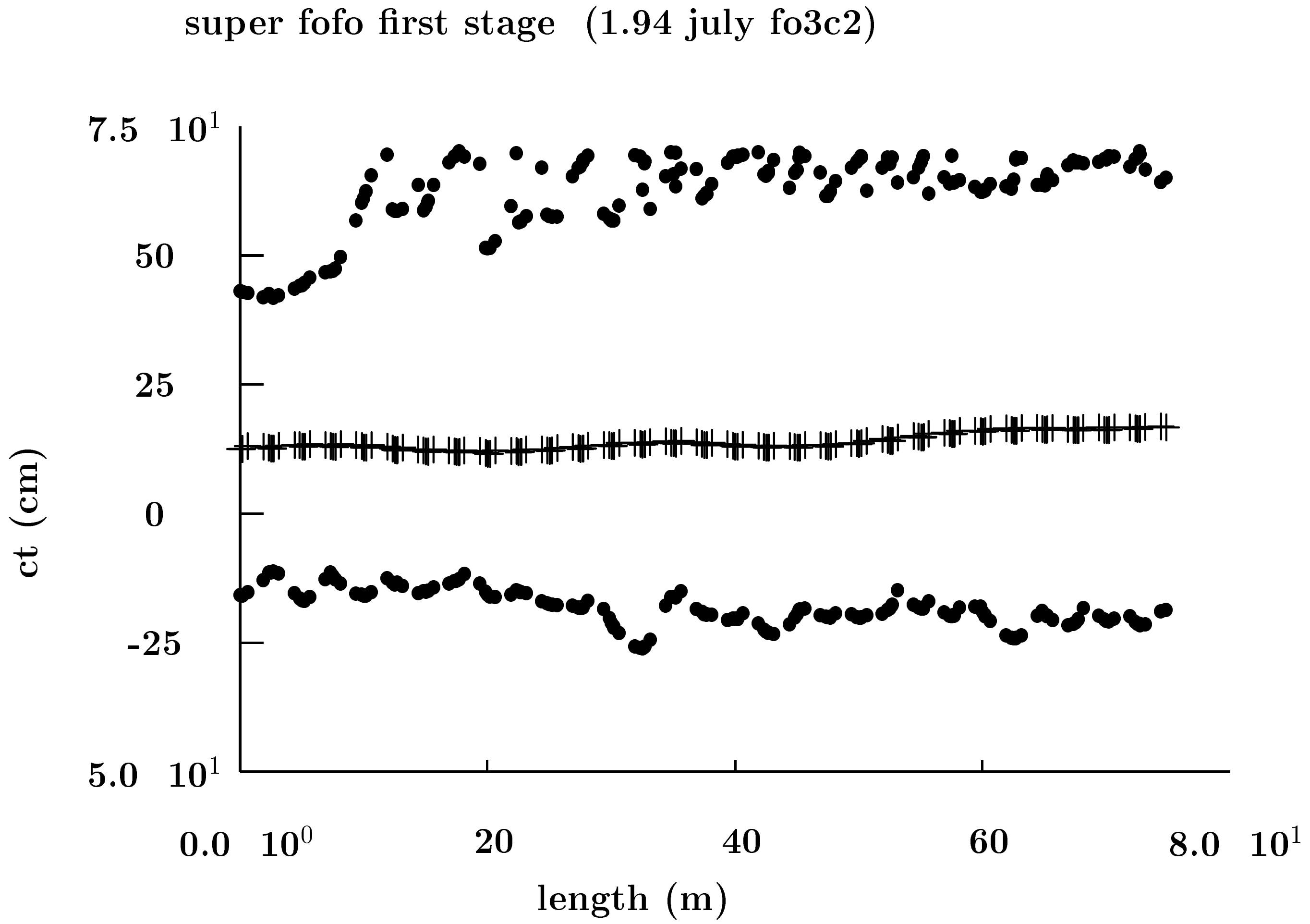
super fofo first stage (1.94 july fo3c2)
n/n = 921 / 1000
3.0 10^1
20
10
0.0 10^0
rms rad (cm)
0.0 10^0
20
40
60
len (m)

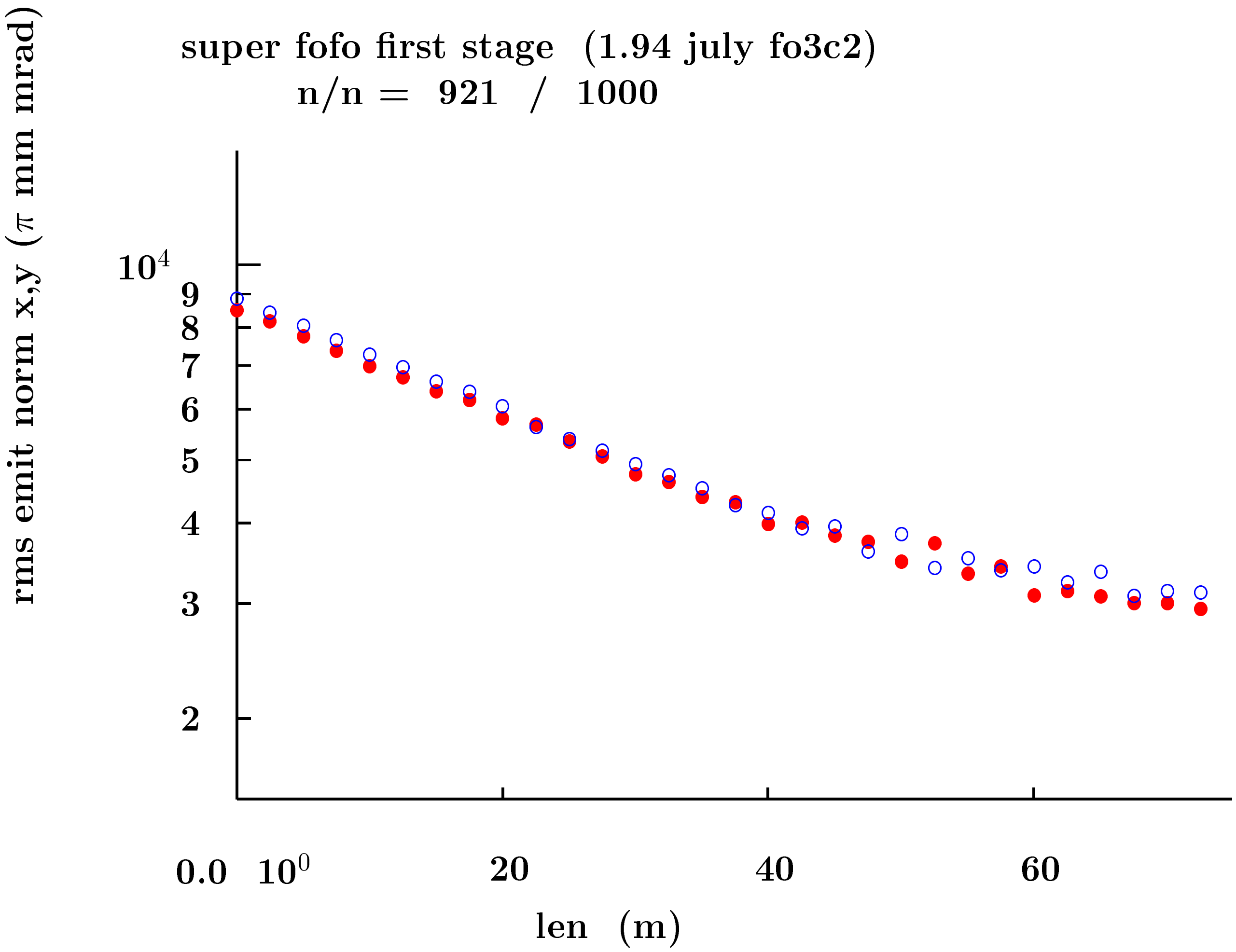

super fofo first stage (1.94 july fo3c2)
n/n = 921 / 1000
1.0 10^3
750
500
250
0.0 10^0
rms theta (mrad)
0.0 10^0
20
40
60
len (m)

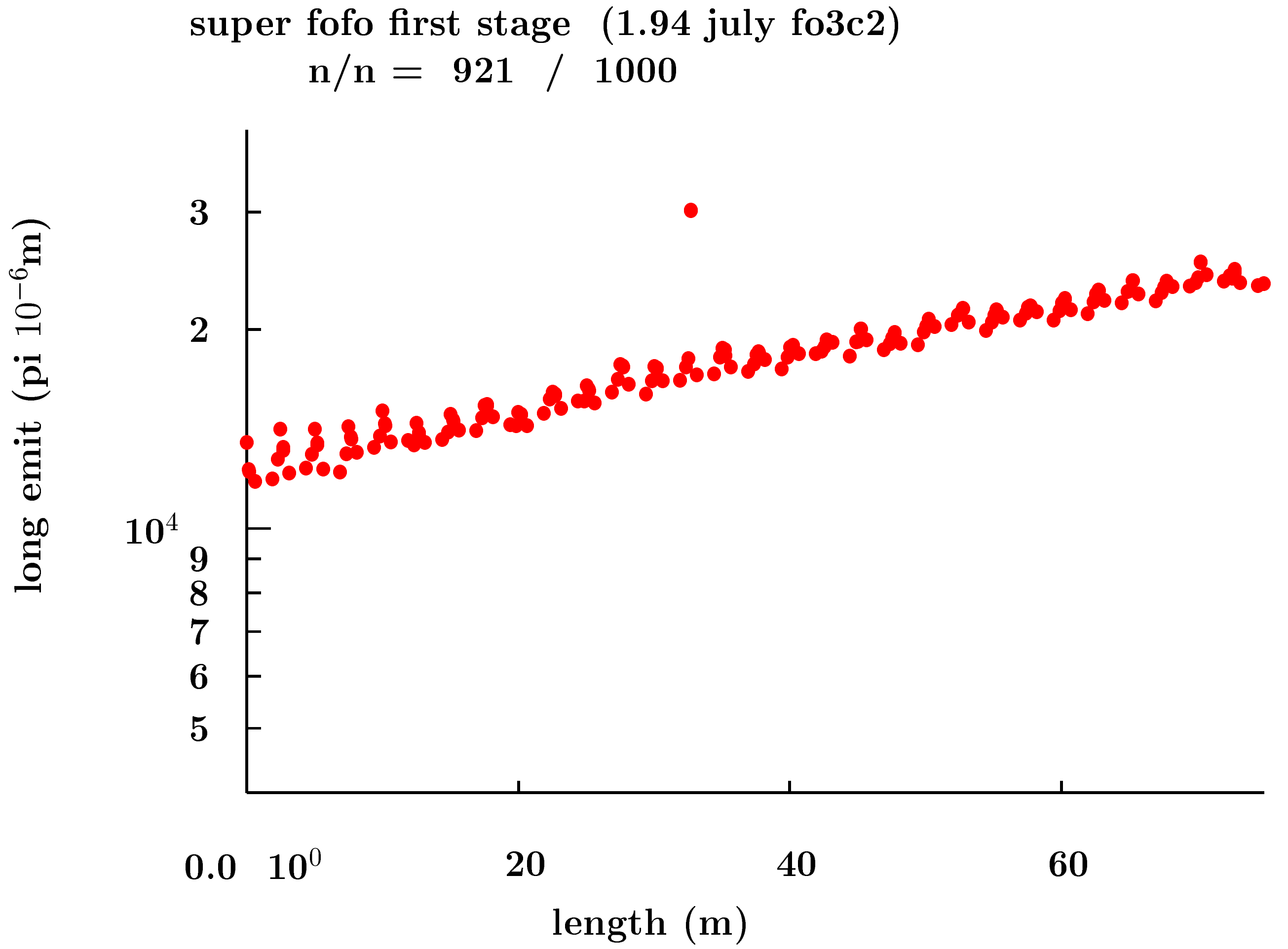

super fofo first stage (1.94 july fo3c2)
n/n = 921 / 1000
rms corr momentum (%)
1.5 10^1
10
5
0.0 10^0
0.0 10^0
20
40
60
length (m)

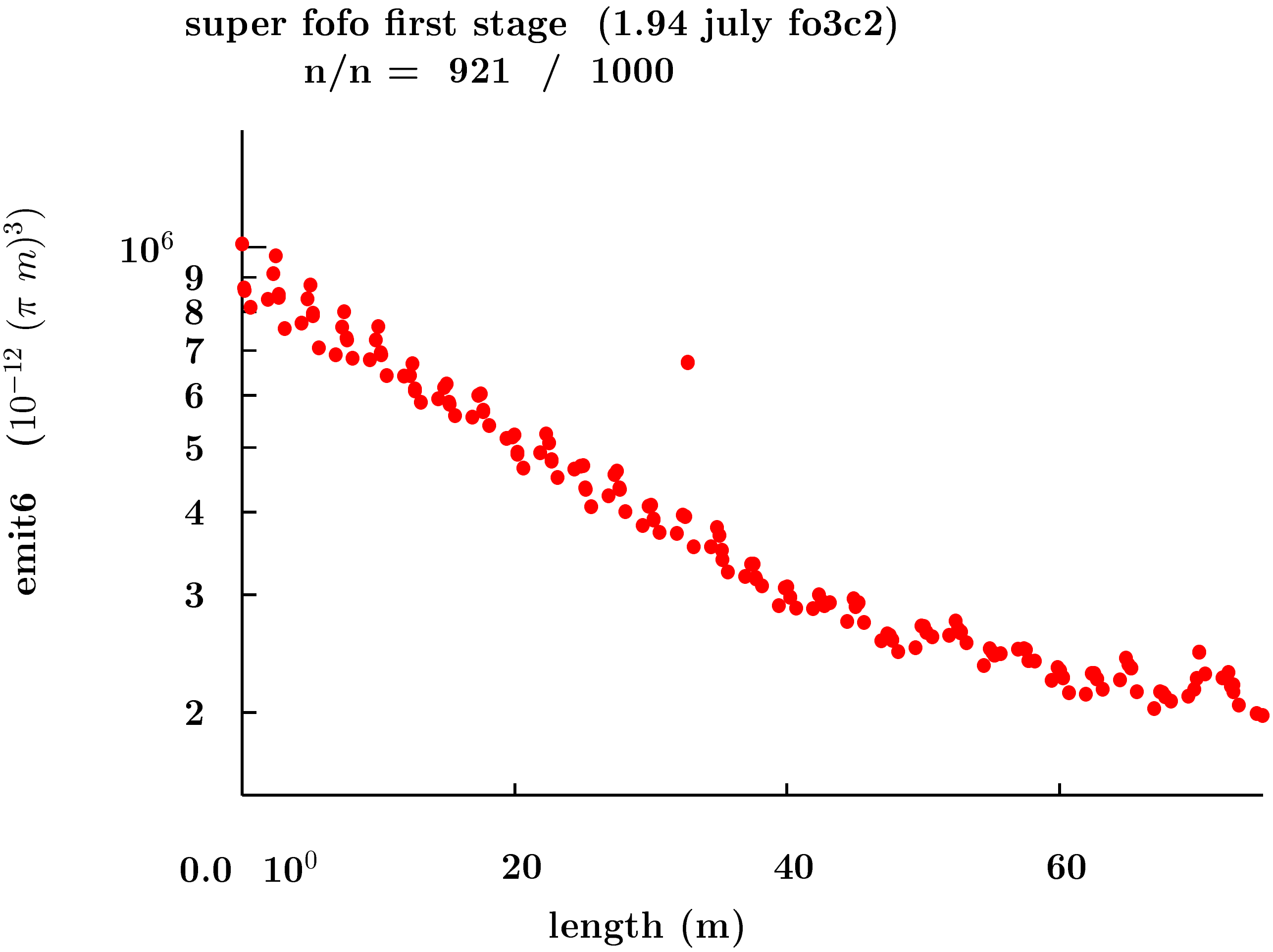
super fofo first stage (1.94 july fo3c2)

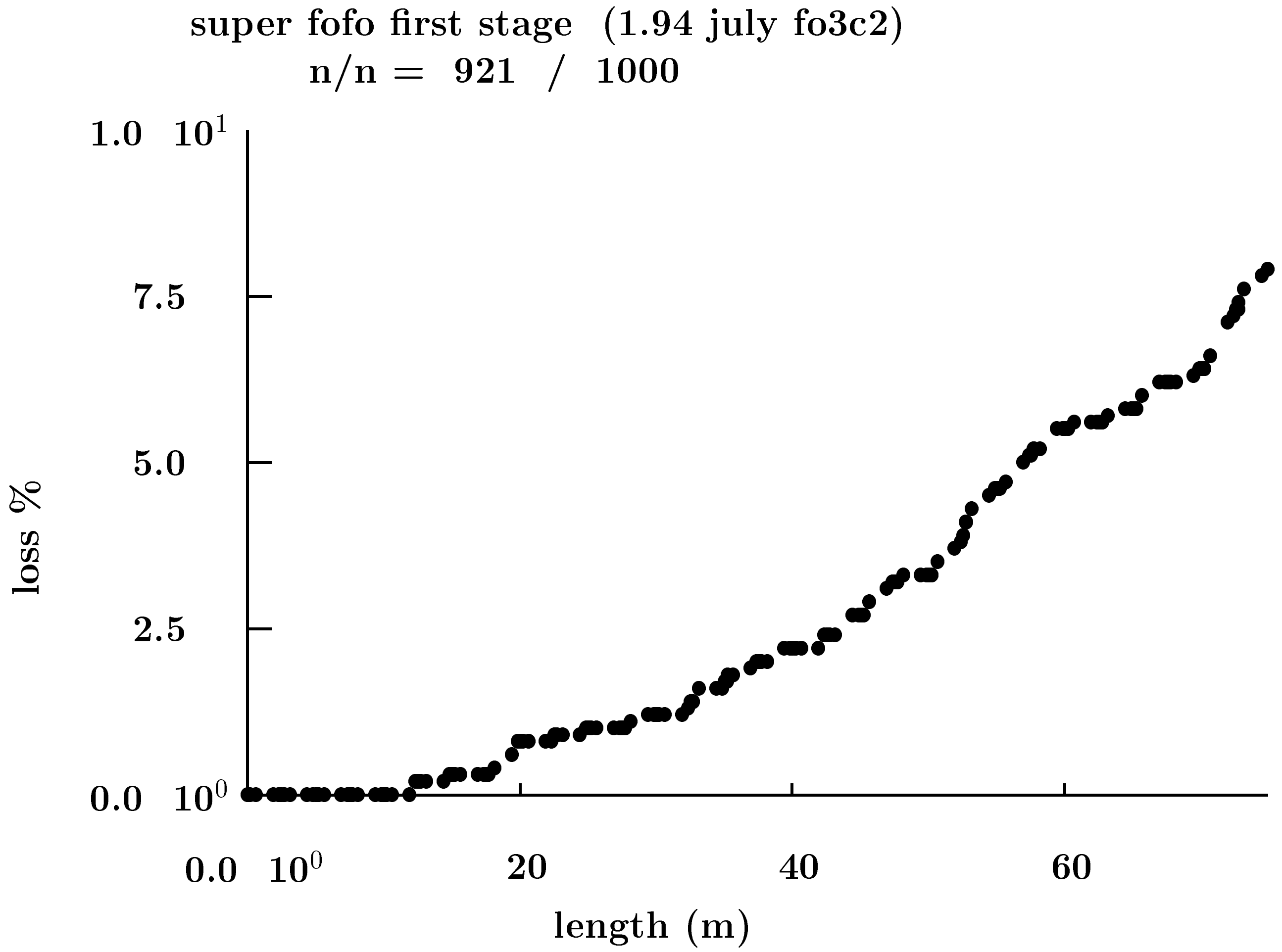


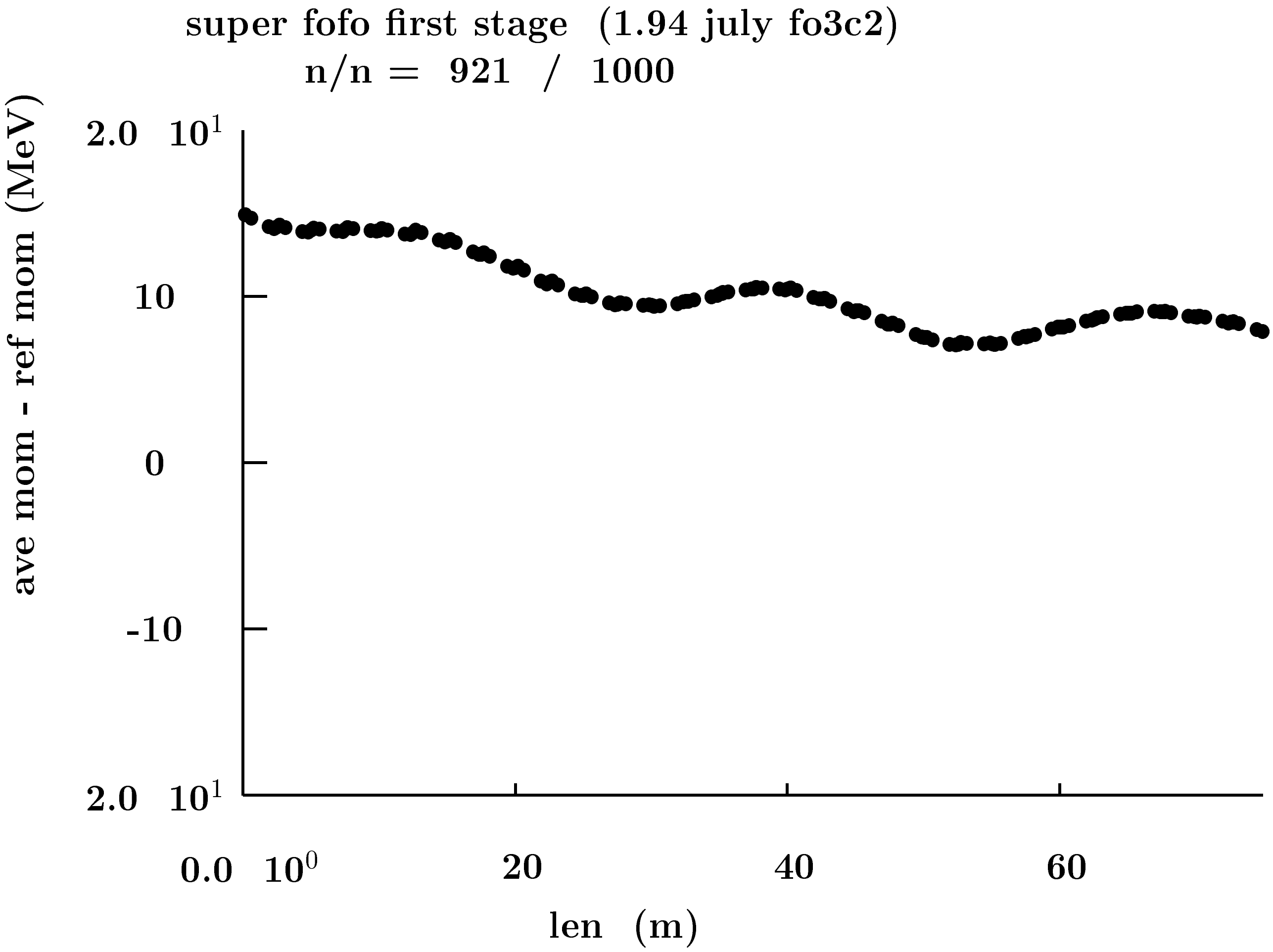

super fofo first stage (1.94 july fo3c2)
7.5 10^1
50
25
0
-25
5.0 10^1
ct (cm)
0.0 10^0
20
40
60
8.0 10^1
length (m)


super fofo first stage (1.94 july fo3c2)
n/n = 921 / 1000
rms emit norm x,y (π mm mrad)
10^4
9
8
7
6
5
4
3
2
0.0 10^0
20
40
60
len (m)


super fofo first stage (1.94 july fo3c2)
n/n = 921 / 1000
long emit (pi 10^{-6}m)
3
2
10^4
9
8
7
6
5
0.0
10^0
20
40
60
length (m)


super fofo first stage (1.94 july fo3c2)
n/n = 921 / 1000
emit6 $(10^{-12}\ (\pi\ m)^3)$
10^6
9
8
7
6
5
4
3
2
0.0
10^0
20
40
60
length (m)


super fofo first stage (1.94 july fo3c2)
n/n = 921 / 1000
1.0 10^1
7.5
5.0
2.5
0.0 10^0
loss %
0.0 10^0
20
40
60
length (m)


super fofo first stage (1.94 july fo3c2)
n/n = 921 / 1000
ave mom - ref mom (MeV)
2.0 10^1
10
0
-10
2.0 10^1
0.0 10^0
20
40
60
len (m)