10 T Super FOFO

Note

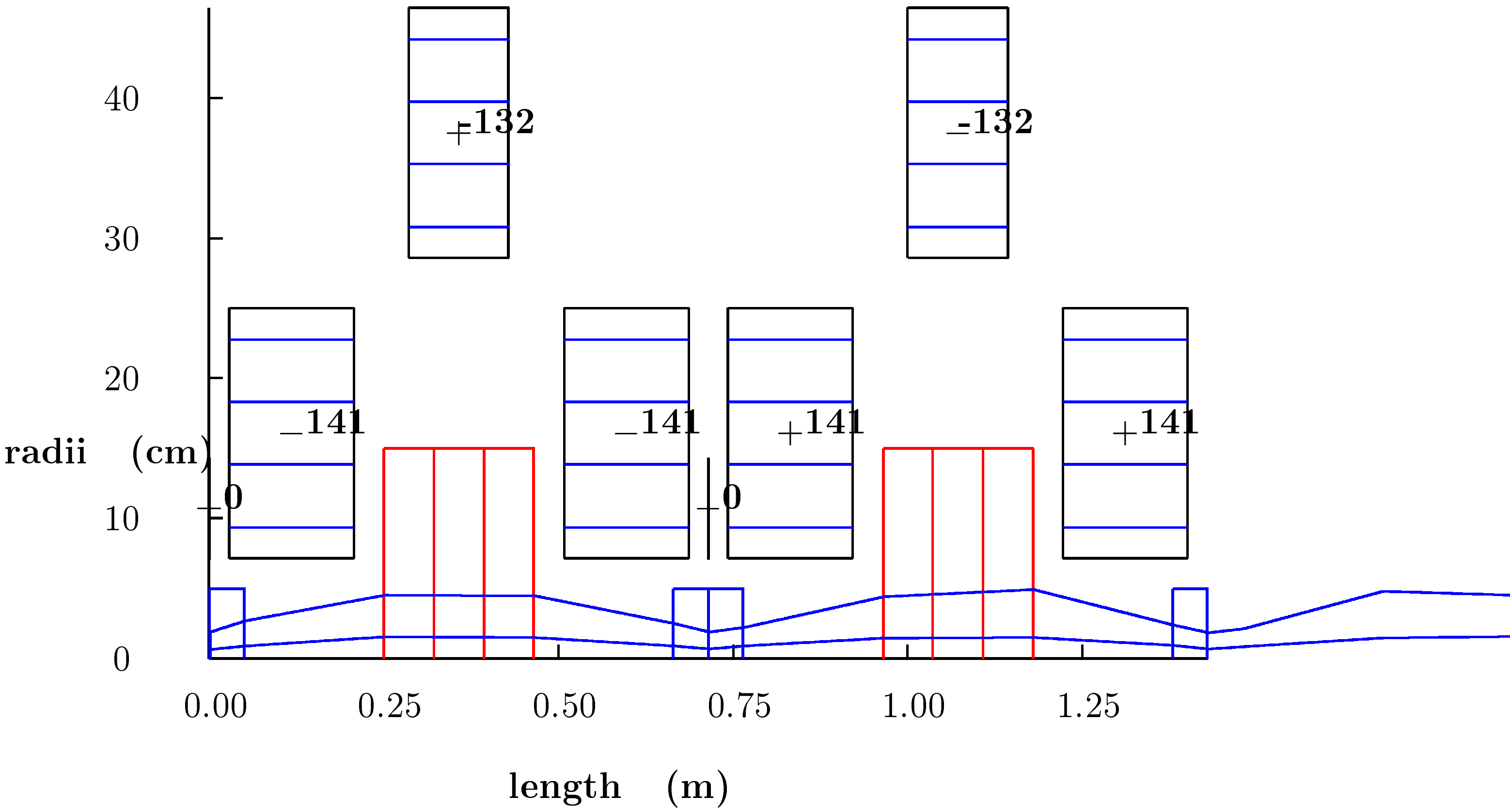
This example cools to about the same minimum emittance as the standard 15 T alternating solenoid example, but uses only 10 T instead of 15 T. It also has less loss and seems altogether less sensitive.

But less of the length is full of rf, and as a result the rate of cooling as a function of distance is less.

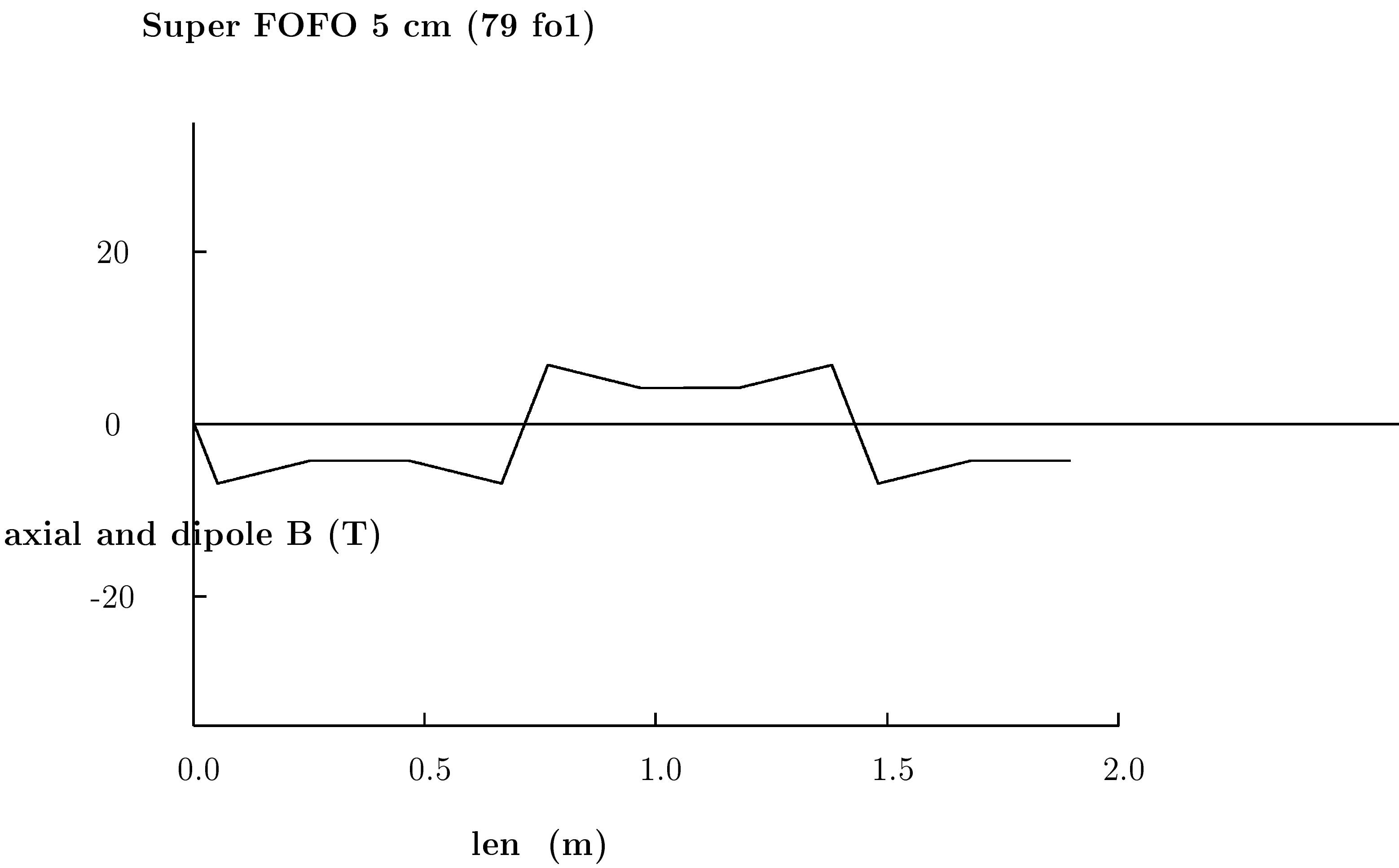
len1	dl	rad	dr		I/A
m	m	m	m		A/mm^2
0.028	0.179	0.071	0.179	4	141.92
0.286	0.143	0.286	0.179	4	-132.22
0.507	0.179	0.071	0.179	4	141.92
0.714	0.000	0.071	0.071	1	0.00

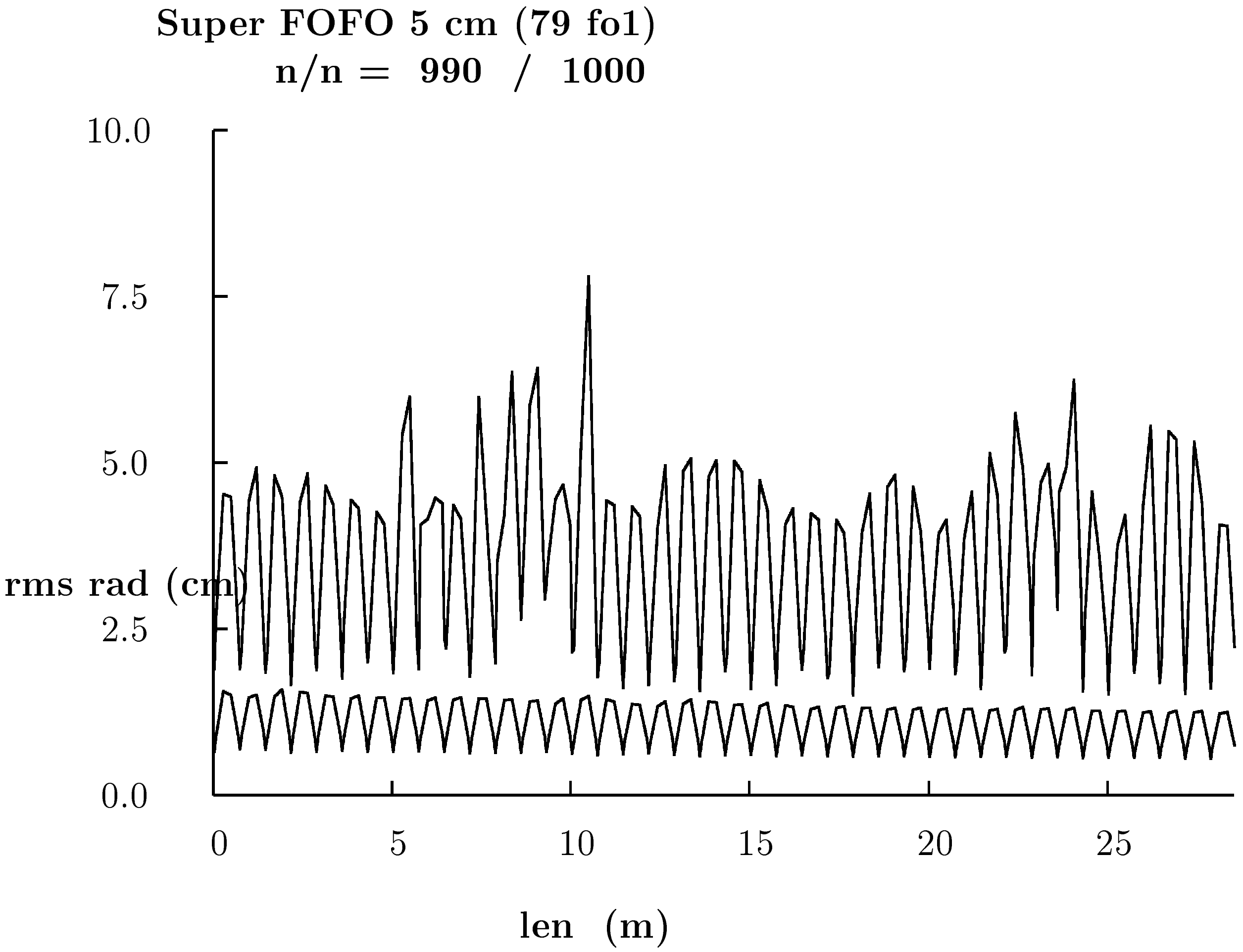
Hydrogen 5 cm
Al Window: 50 micron 3 cm rad
Gap 20 cm
3 RF pillbox cavities
    lengths 7.1 cm
    freq 805 MHz
    grad 36 MV/m
    windows 50 micron Be 5cm rad
gap
Al window

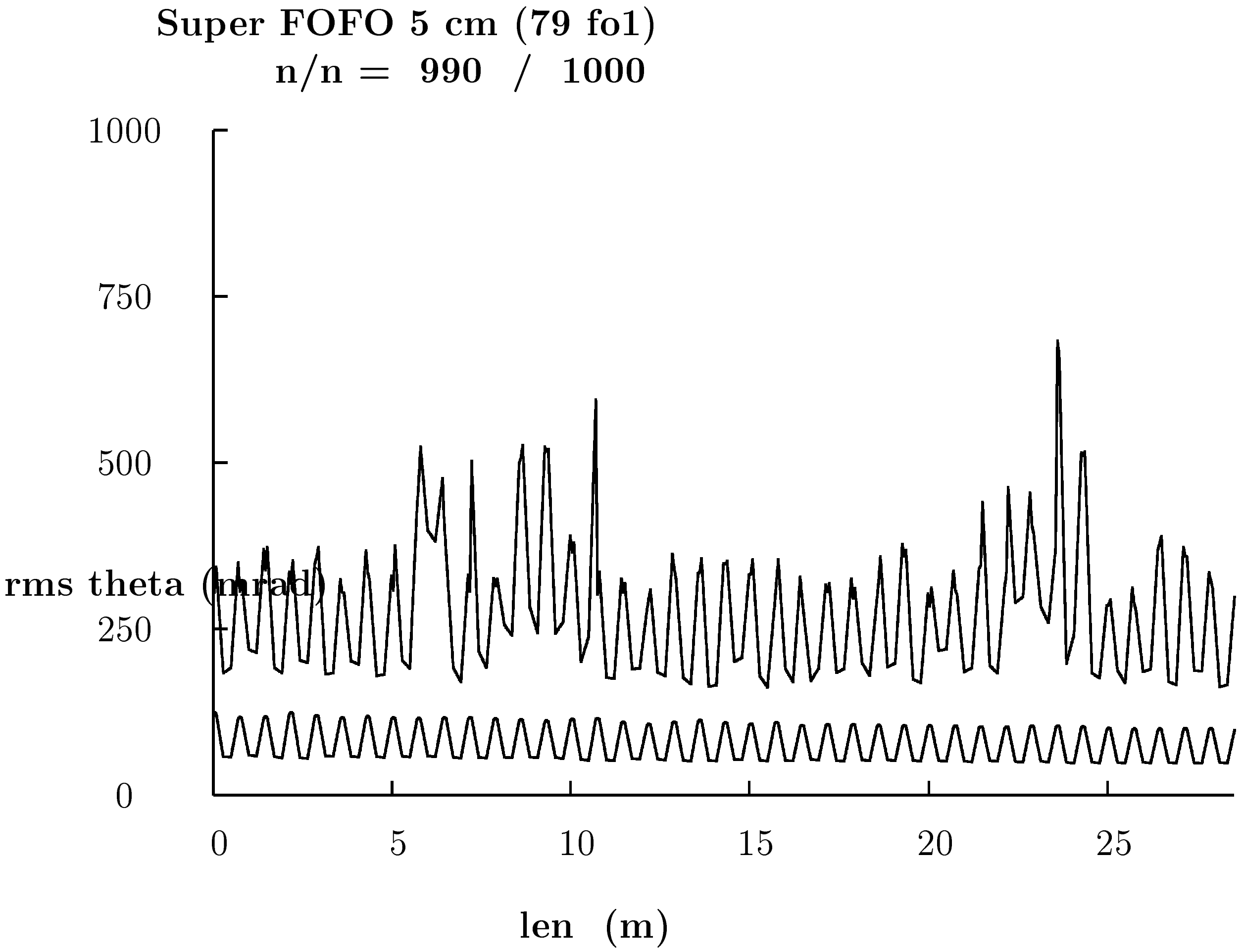
Note: The window thicknesses are arbitary



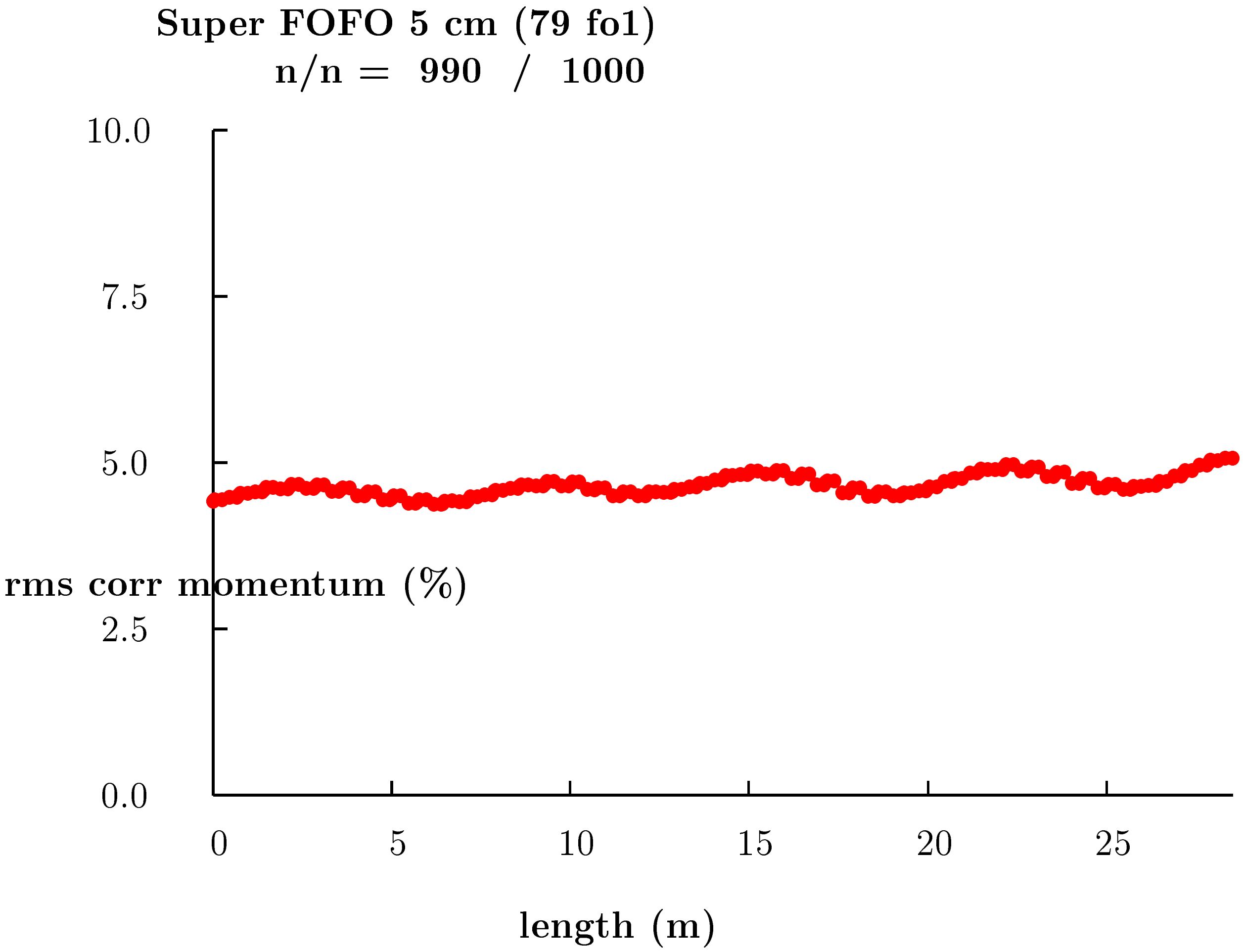
40
30
20
10
0
radii (cm)
-132
-132
−141
−141
+141
+141
0
0
0.00
0.25
0.50
0.75
1.00
1.25
length (m)


Super FOFO 5 cm (79 fo1)
20
0
-20
axial and dipole B (T)
0.0
0.5
1.0
1.5
2.0
len (m)

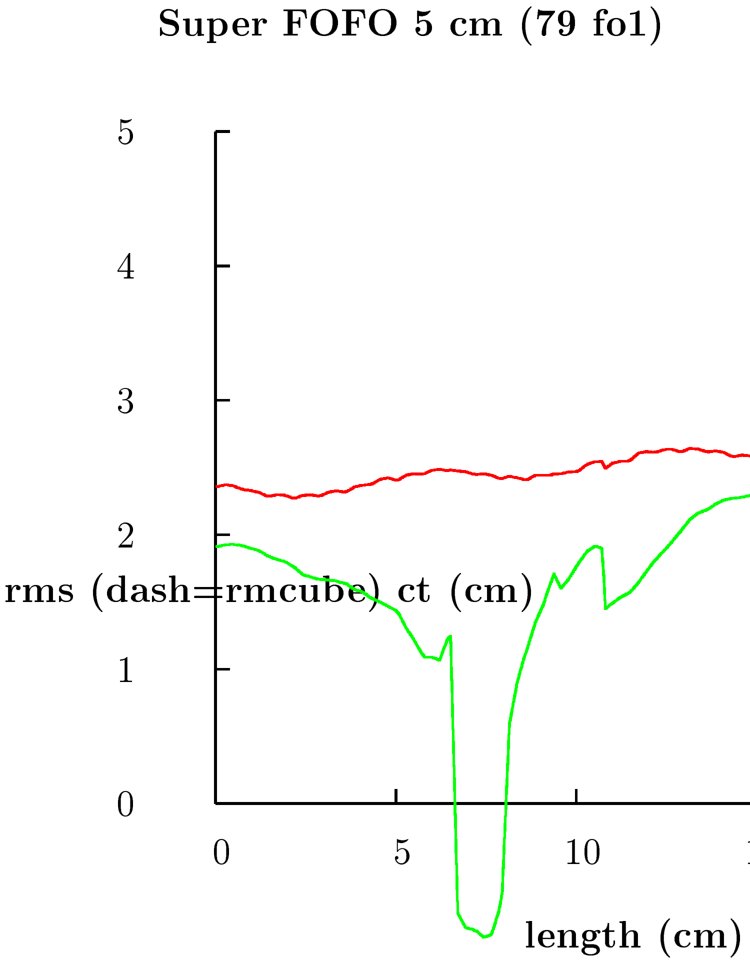

Super FOFO 5 cm (79 fo1)
n/n = 990 / 1000
10.0
7.5
5.0
2.5
0.0
rms rad (cm)
0
5
10
15
20
25
len (m)

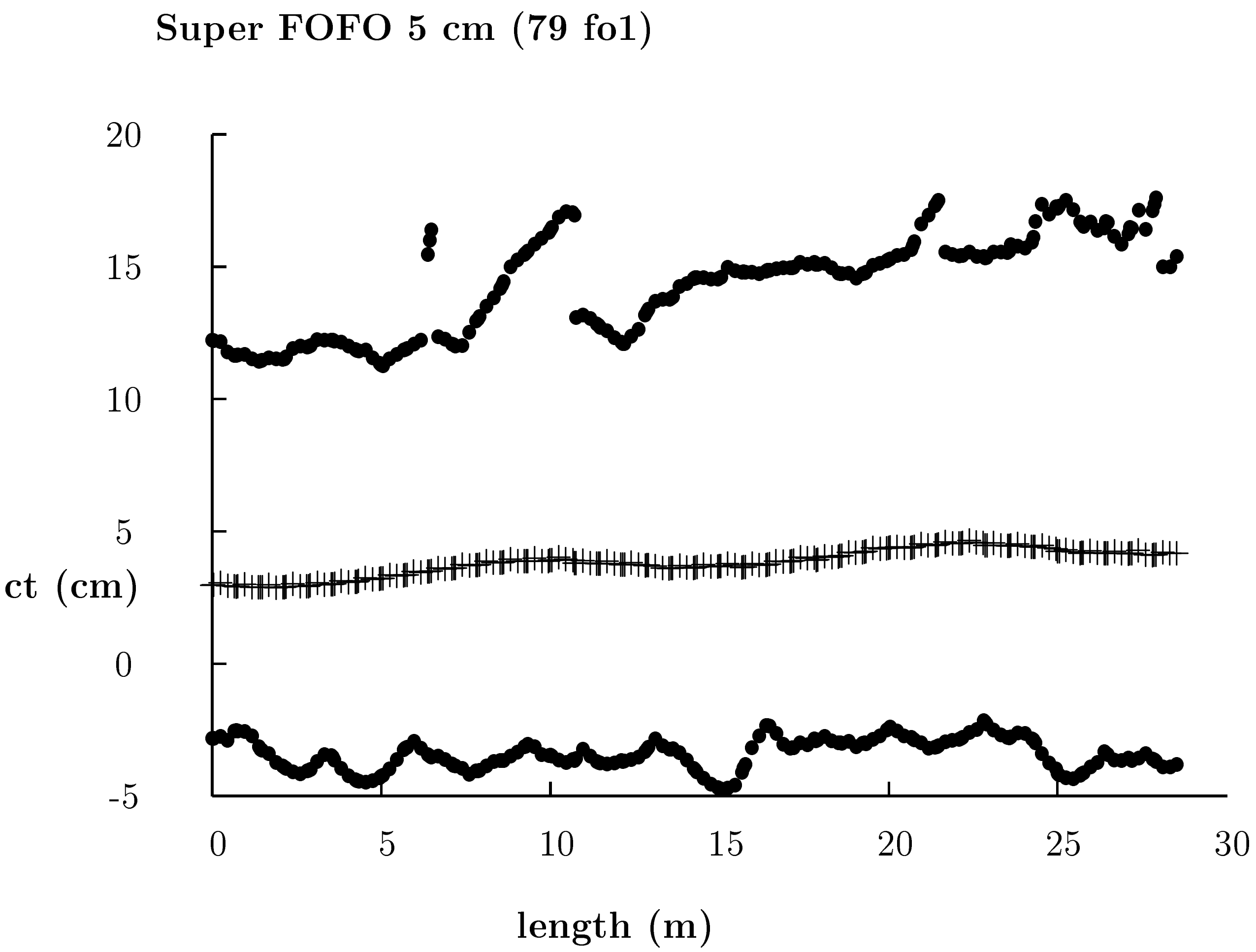


Super FOFO 5 cm (79 fo1)
n/n = 990 / 1000
1000
750
500
250
0
rms theta (mrad)
0
5
10
15
20
25
len (m)

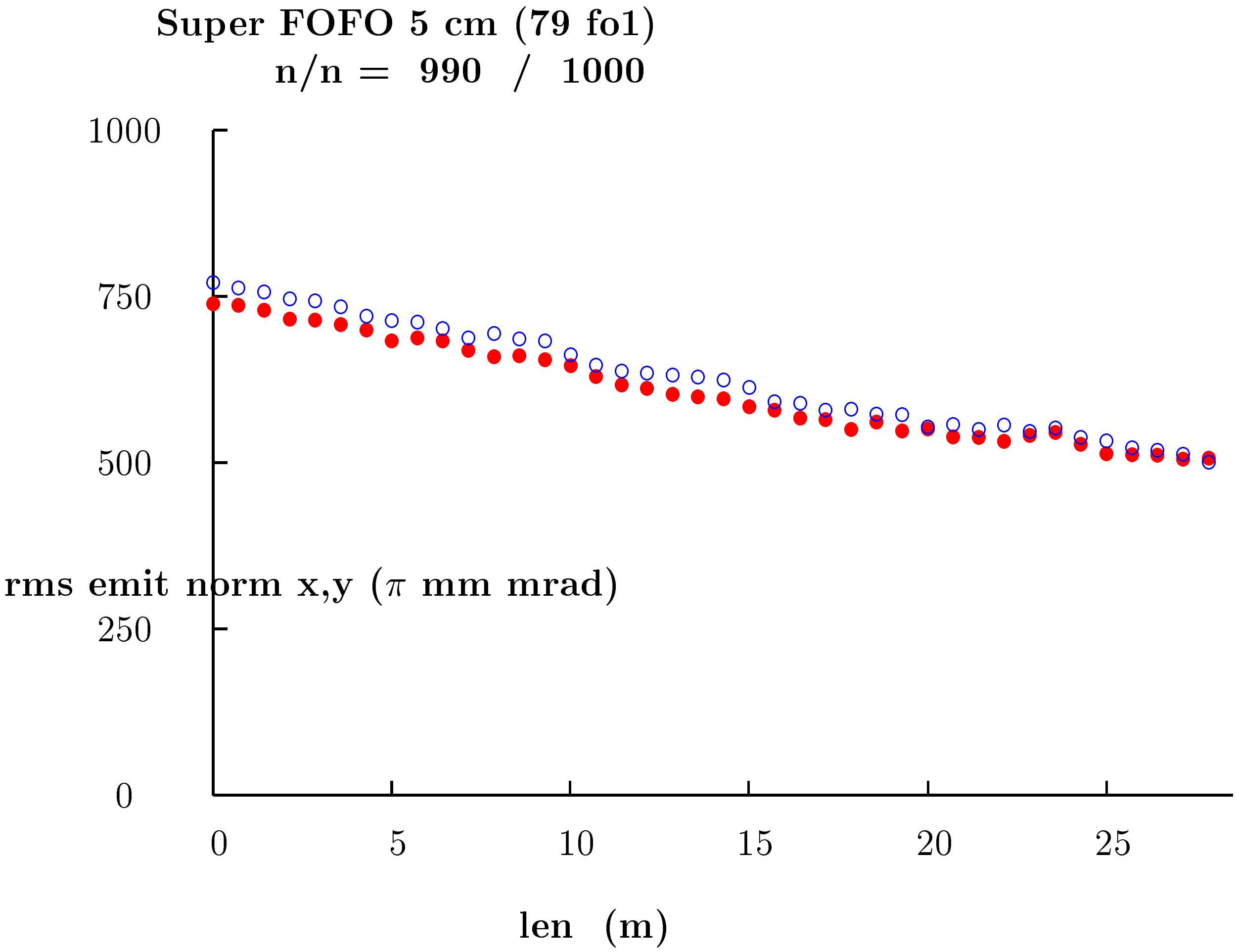


Super FOFO 5 cm (79 fo1)
n/n = 990 / 1000
10.0
7.5
5.0
2.5
0.0
rms corr momentum (%)
0
5
10
15
20
25
length (m)

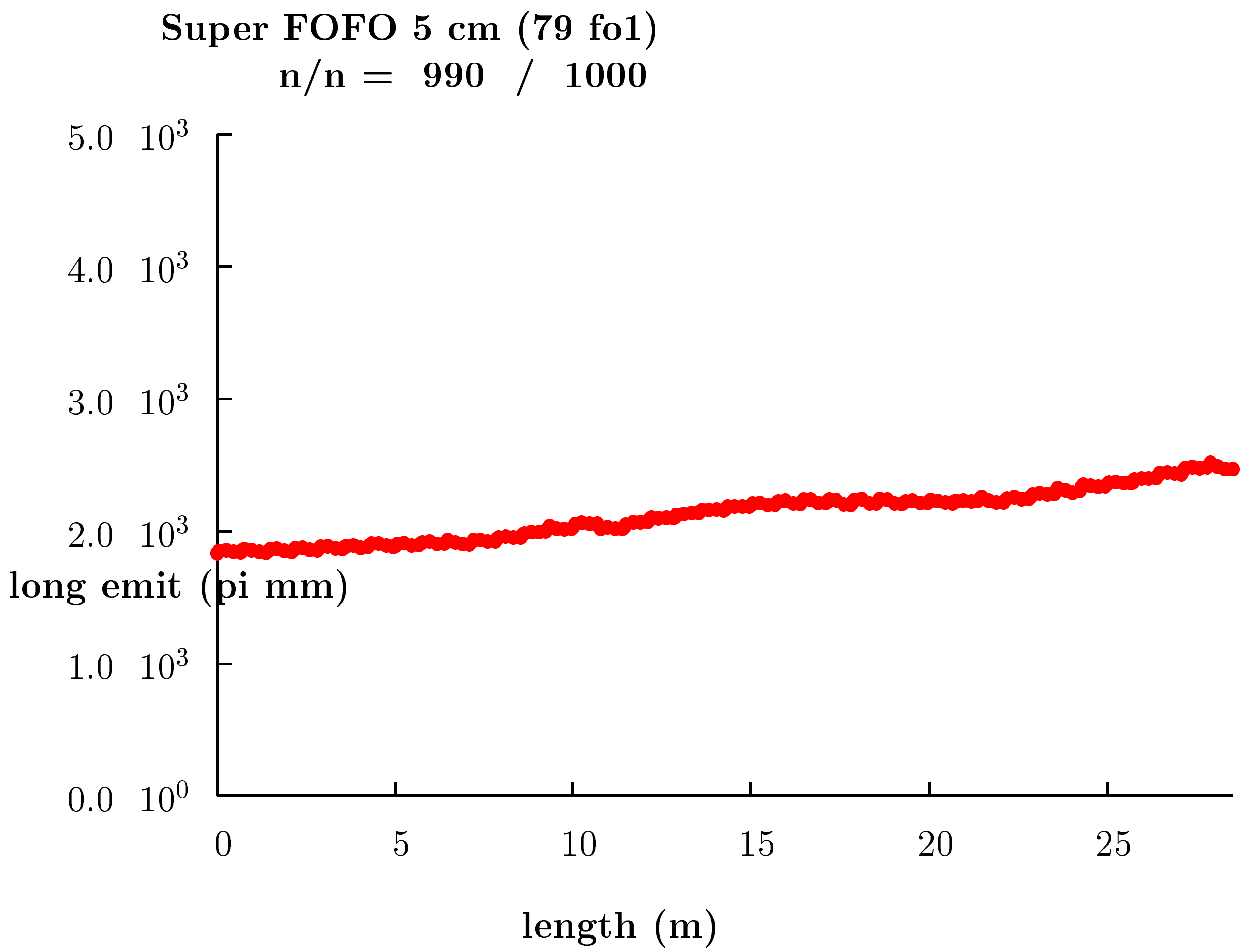

Super FOFO 5 cm (79 fo1)
rms (dash=rmcube) ct (cm)
length (cm)
0
1
2
3
4
5
0
5
10
15
20
25



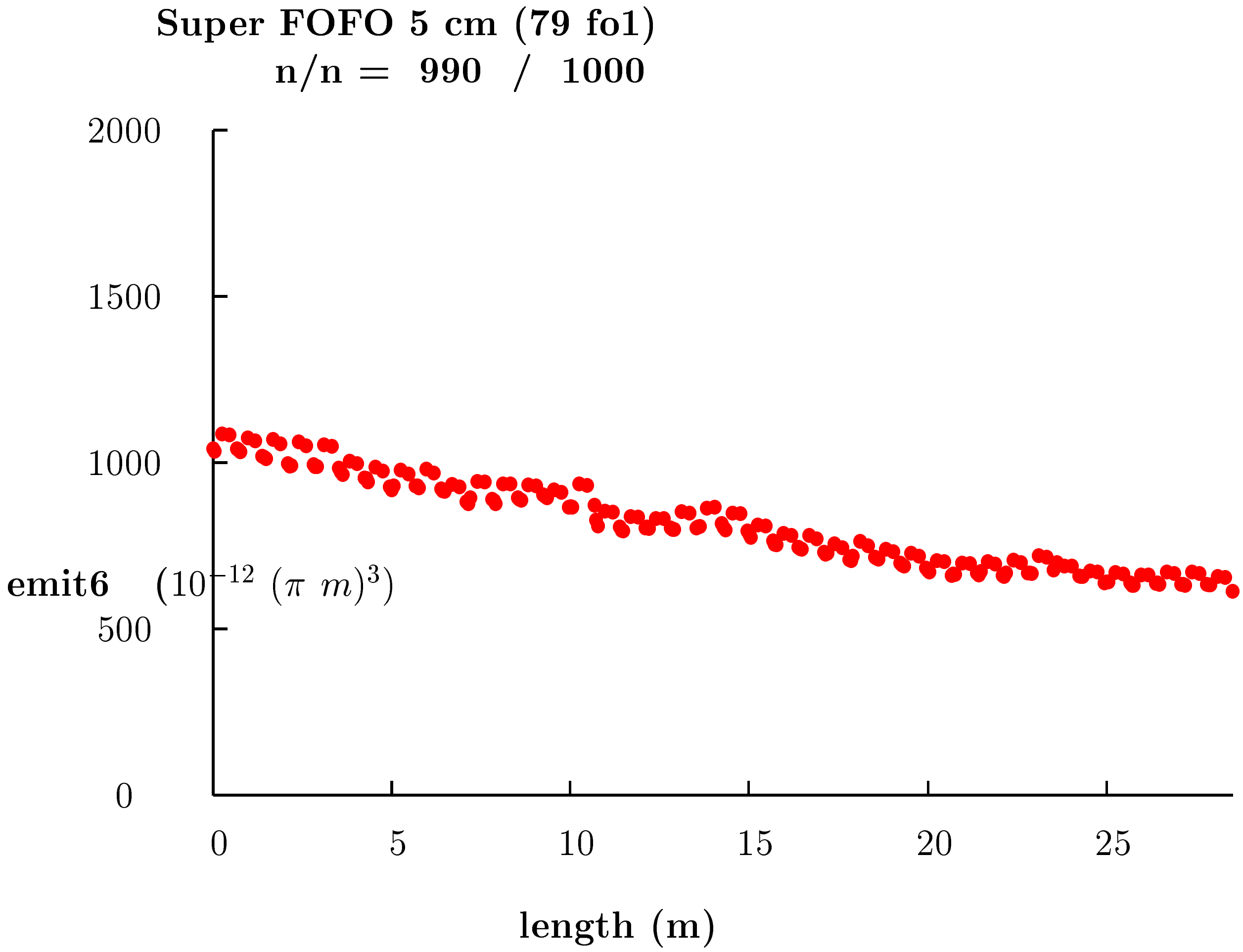
Super FOFO 5 cm (79 fo1)
20
15
10
5
ct (cm)
0
-5
0
5
10
15
20
25
30
length (m)



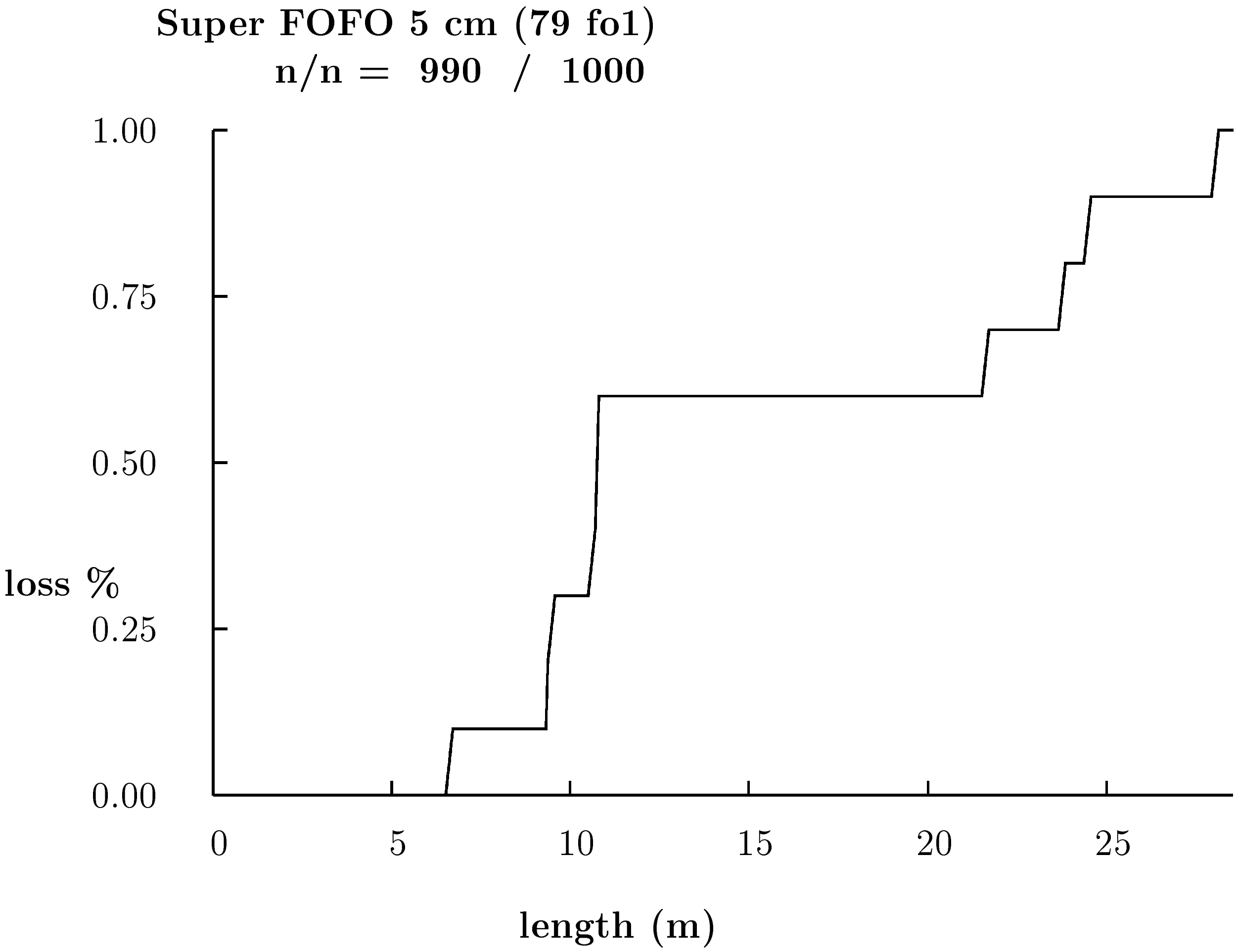
Super FOFO 5 cm (79 fo1)
n/n = 990 / 1000
1000
750
500
250
0
rms emit norm x,y (π mm mrad)
0
5
10
15
20
25
len (m)

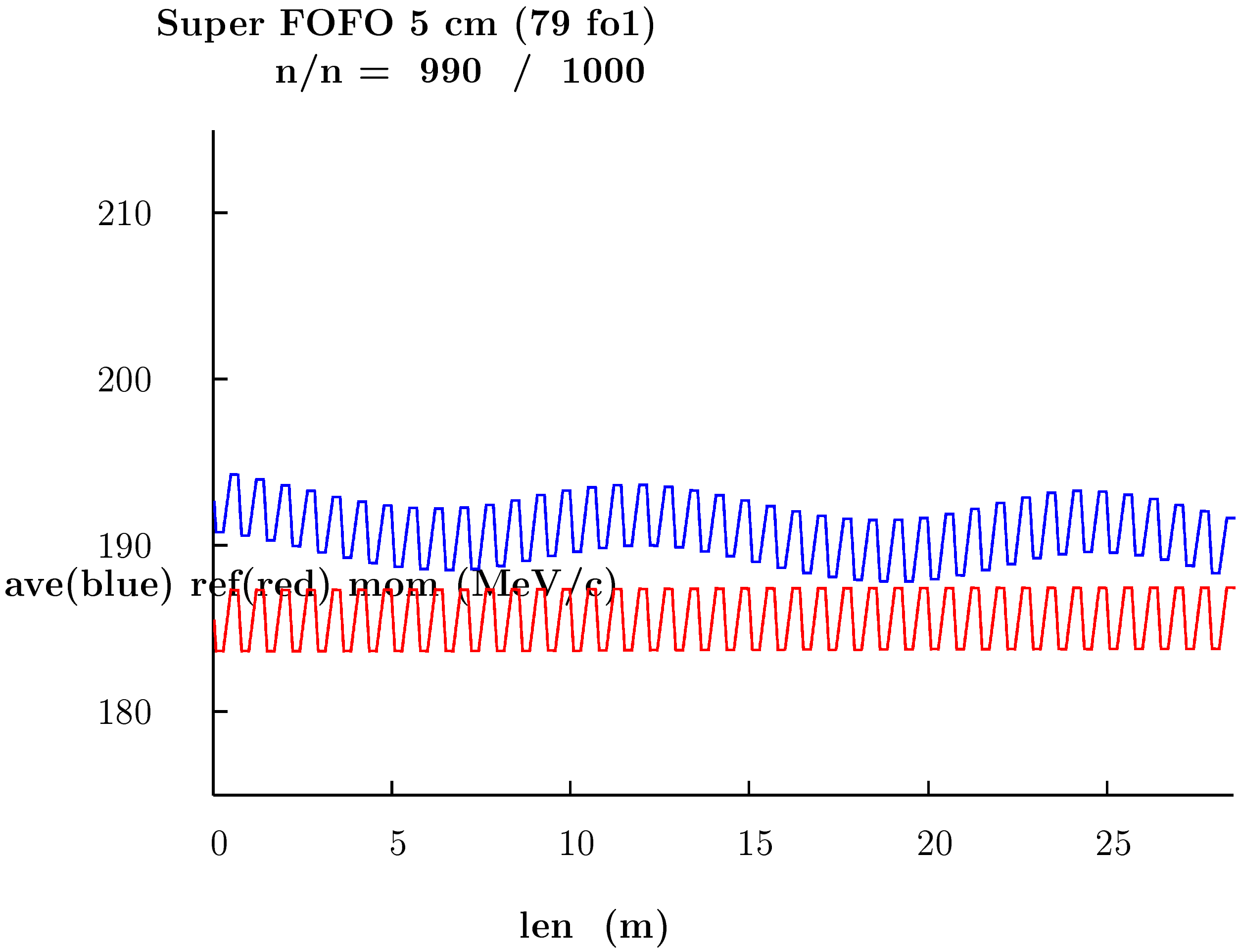


Super FOFO 5 cm (79 fo1)
n/n = 990 / 1000
5.0 10^3
4.0 10^3
3.0 10^3
2.0 10^3
1.0 10^3
0.0 10^0
long emit (pi mm)
0
5
10
15
20
25
length (m)



Super FOFO 5 cm (79 fo1)
n/n = 990 / 1000
2000
1500
1000
500
0
emit6 $(10^{-12}\ (\pi\ m)^3)$
0
5
10
15
20
25
length (m)


Super FOFO 5 cm (79 fo1)
n/n = 990 / 1000
1.00
0.75
0.50
0.25
0.00
loss %
0
5
10
15
20
25
length (m)


Super FOFO 5 cm (79 fo1)
n/n = 990 / 1000
210
200
190
180
ave(blue) ref(red) mom (MeV/c)
0
5
10
15
20
25
len (m)