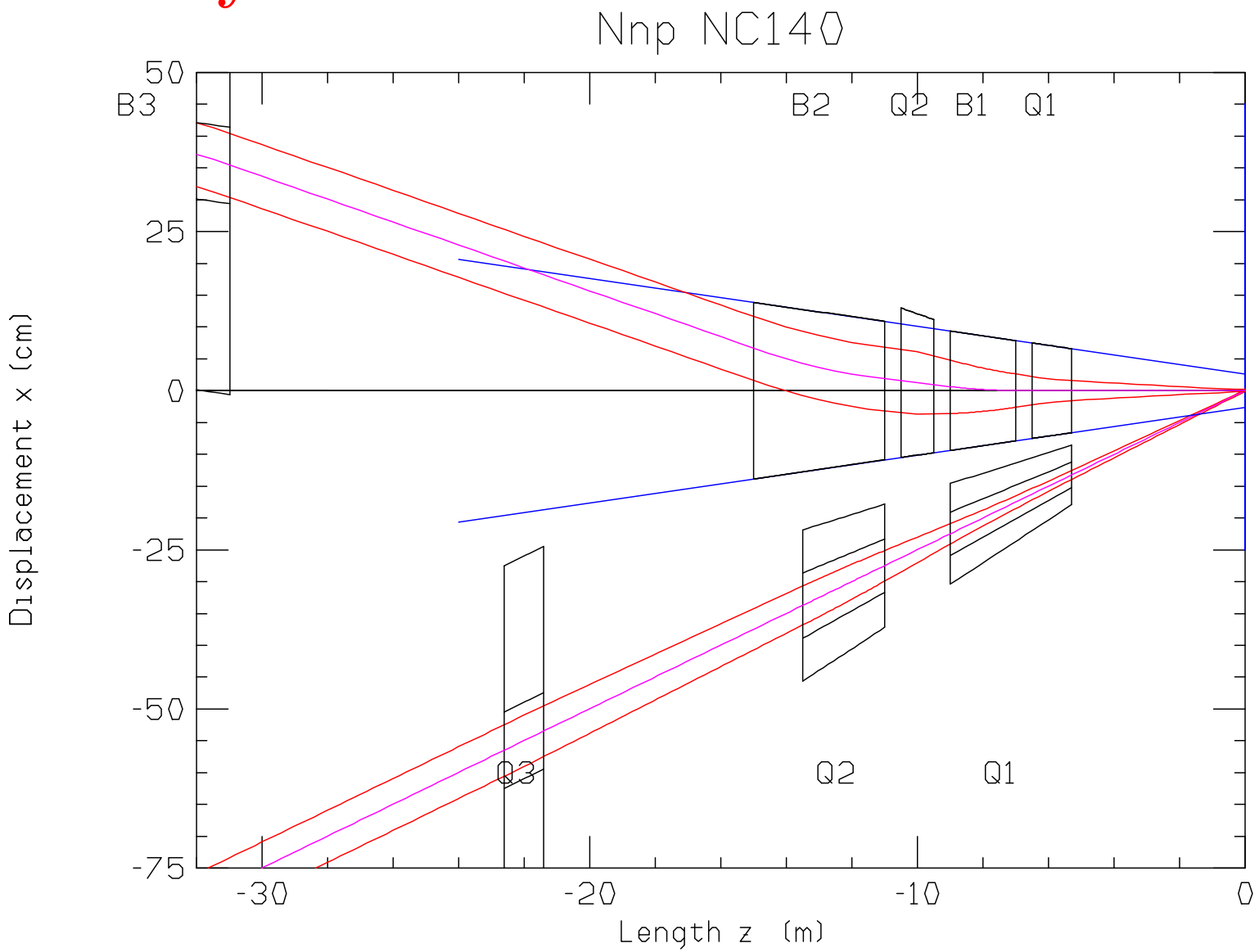
Post pCDR IR v1

6/7/18

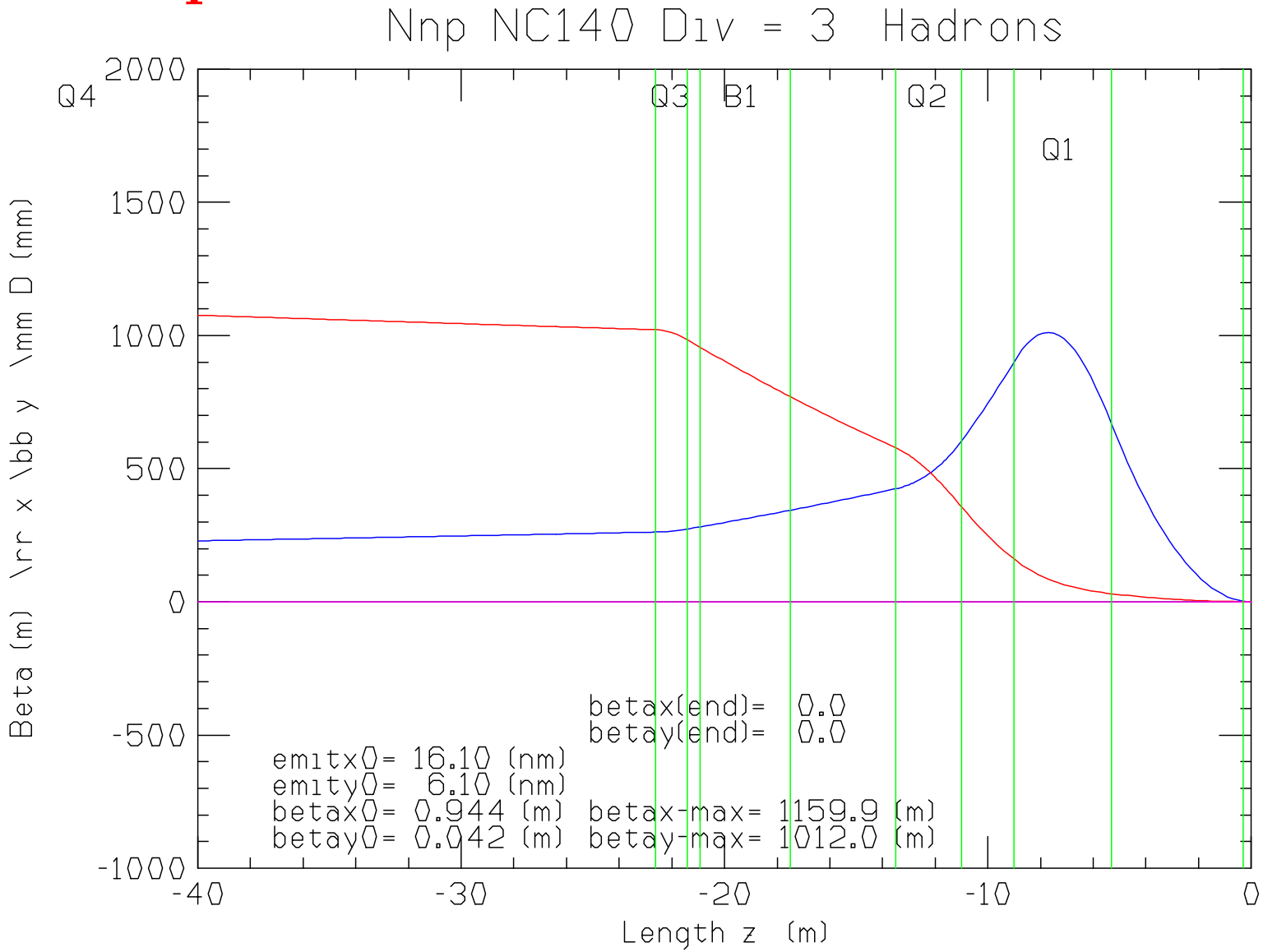
R.B.Palmer

- Crossing at 25 mrad (22)
- start e quads at 4.5 + 0.8 = 5.3 m (5.5)
- Q1Re length 1.2 m (3.42)
- Q2Re length 2 m (2.57)
- Start p quads at 5.3 m (5.5)
- Q1Rp length 3.7 m (3.42)
- Q2Rp length 2.5 m (2.57)

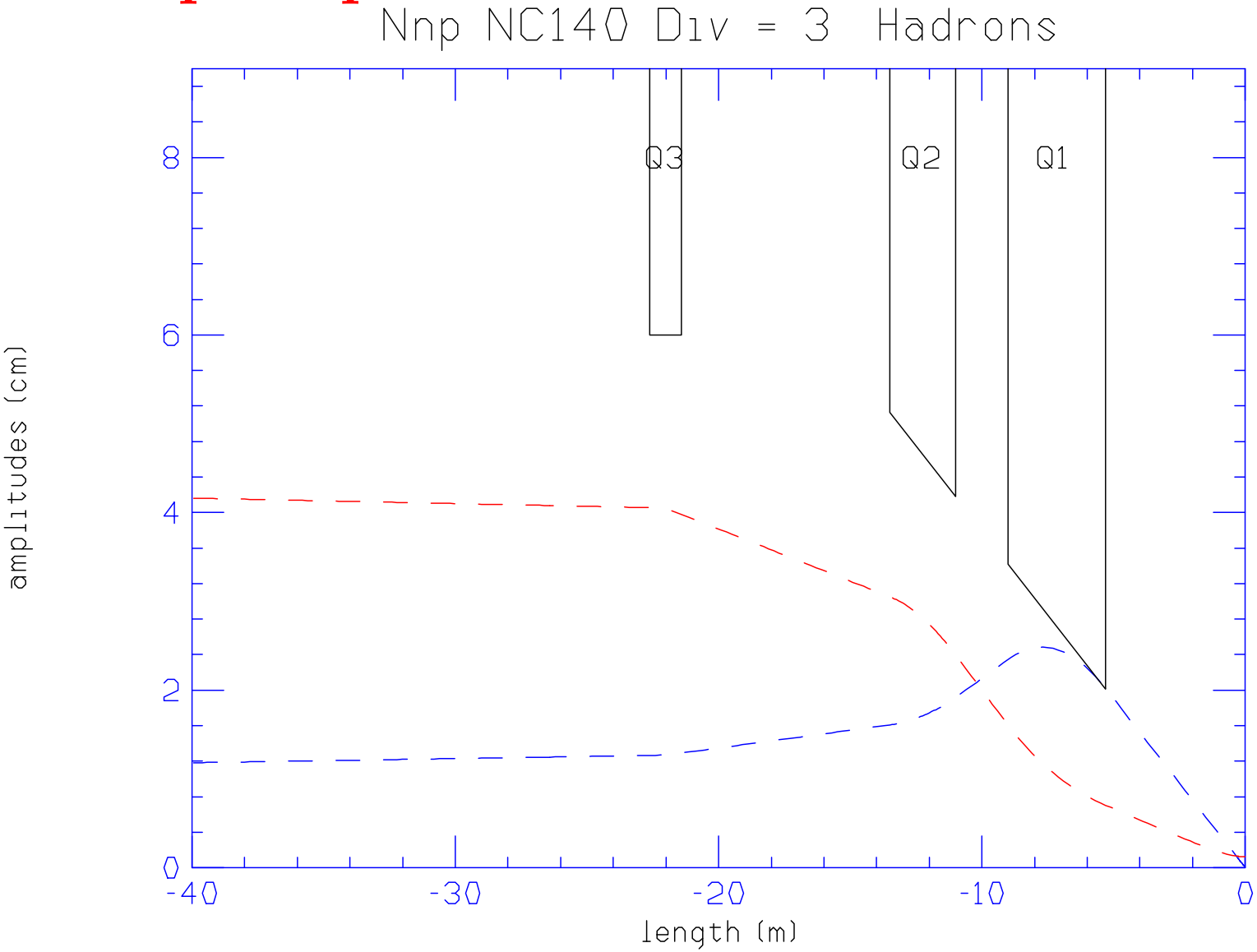
Rear Layout


Nnp NC140
B3
B2
Q2
B1
Q1
50
25
0
-25
-50
-75
Displacement x (cm)
Q3
Q2
Q1
-30
-20
-10
0
Length z (m)

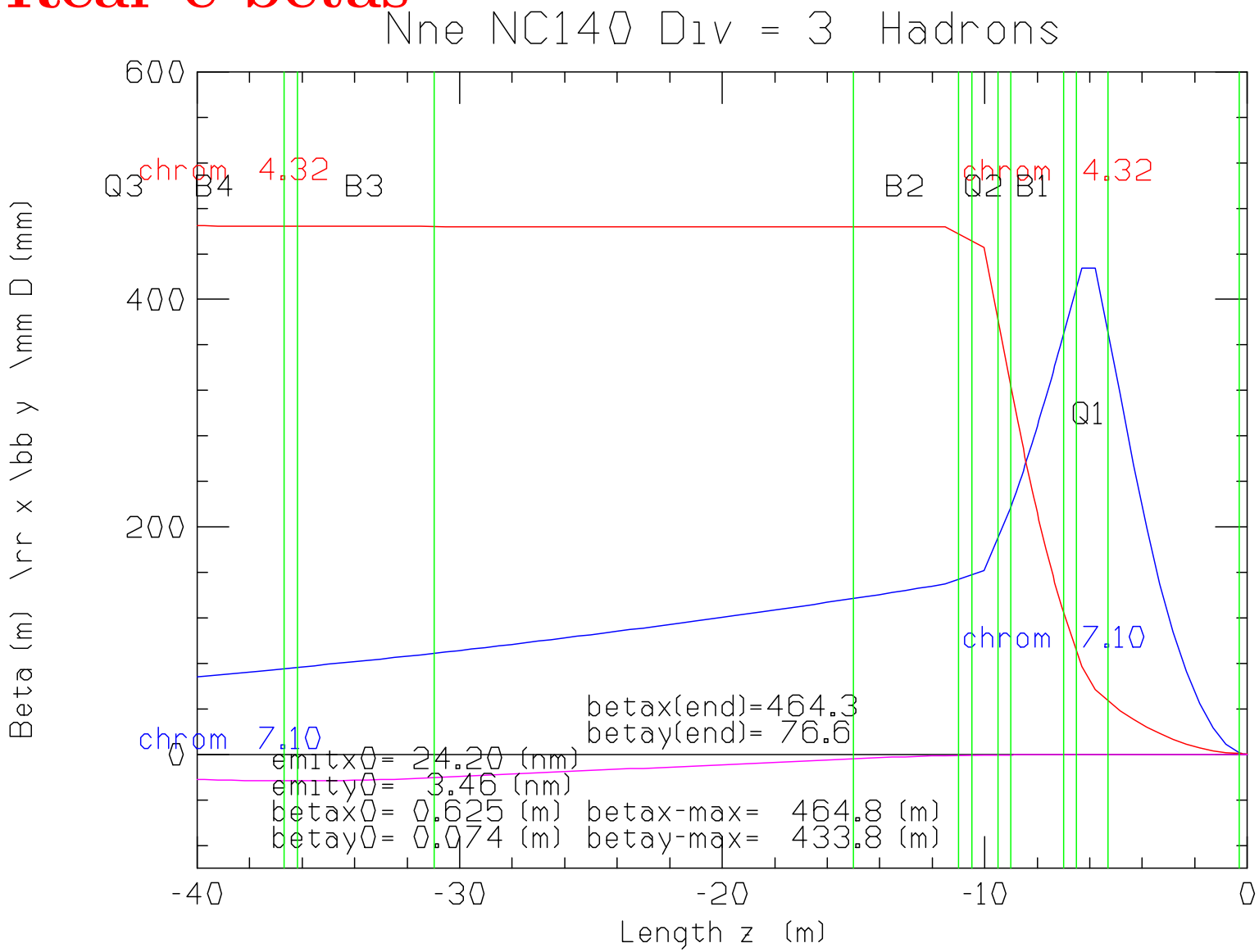
Rear p betas


Nnp NC140 Div = 3 Hadrons
Q4
Q3
B1
Q2
Q1
2000
1500
1000
500
0
-500
-1000
-40
-30
-20
-10
0
Beta (m) \rr x \bb y \mm D (mm)
Length z (m)
betax(end)= 0.0
betay(end)= 0.0
emitx0= 16.10 (nm)
emity0= 6.10 (nm)
betax0= 0.944 (m)
betay0= 0.042 (m)
betax-max= 1159.9 (m)
betay-max= 1012.0 (m)

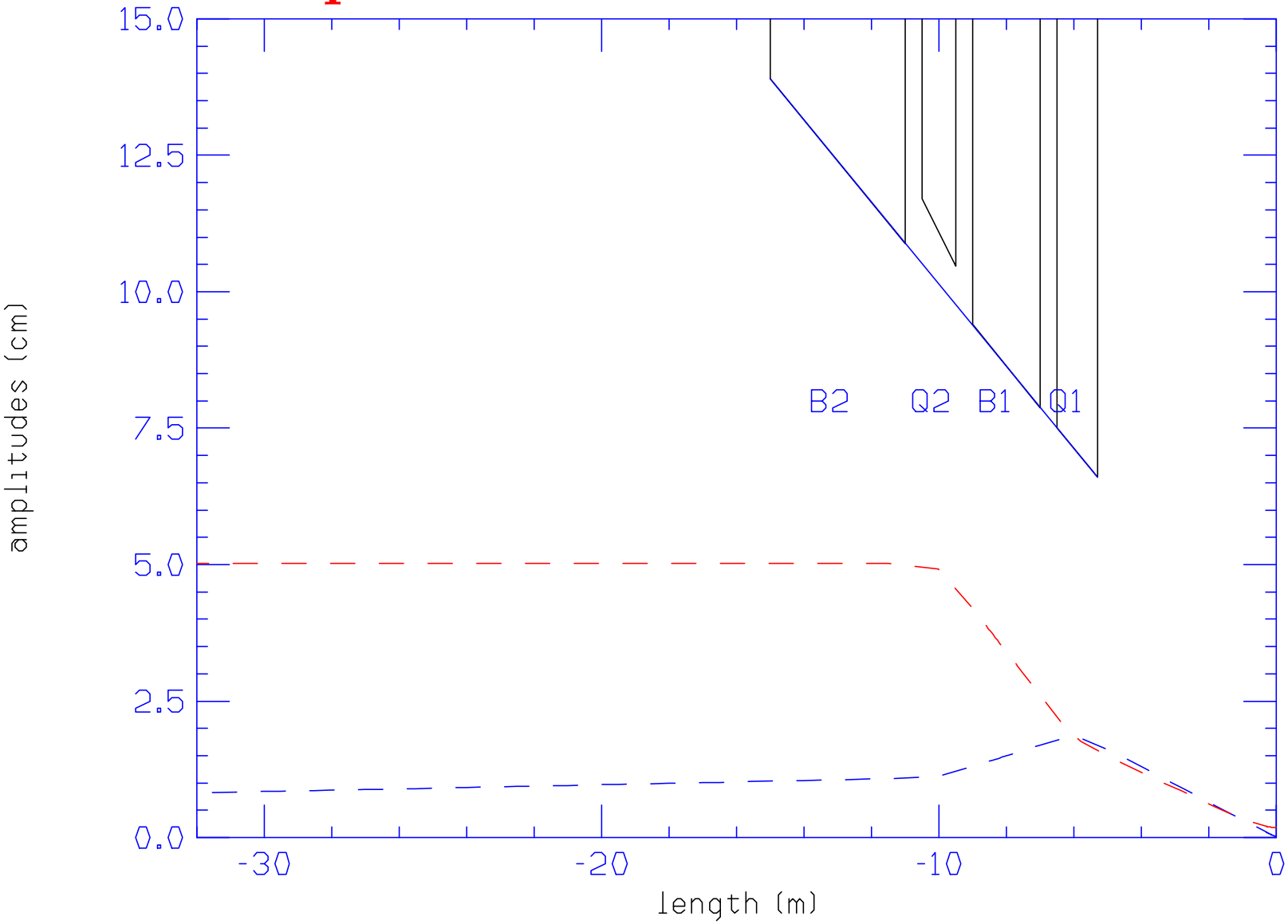
Rear p amps


Nnp NC140 Div = 3 Hadrons
Q3
Q2
Q1
amplitudes (cm)
length (m)
0
2
4
6
8
-40
-30
-20
-10
0

Rear e betas


Nne NC140 Div = 3 Hadrons
600
400
200
0
Beta (m) \rr x \bb y \mm D (mm)
chrom 4.32
Q3
B4
B3
B2
Q2
B1
chrom 4.32
Q1
chrom 7.10
chrom 7.10
betax(end)=464.3
betay(end)= 76.6
emitx0= 24.20 (nm)
emity0= 3.46 (nm)
betax0= 0.625 (m) betax-max= 464.8 (m)
betay0= 0.074 (m) betay-max= 433.8 (m)
-40
-30
-20
-10
0
Length z (m)

Rear e amps


15.0
12.5
10.0
7.5
5.0
2.5
0.0
amplitudes (cm)
B2
Q2
B1
Q1
-30
-20
-10
0
length (m)

Rear Proton Magnets

Chrom y 13.26 Chrom x 6.57 mom = 275

		L1 m	DL m	gap m	x cm	θ mrad	IR_1 cm	IR_2 cm	B T	Bpt T	Grad) T/m
Q1	3	5.30	3.70	2.00	-13.2	-25.00	2.01	3.42	0.000	2.100	-61.417
Q2	5	11.00	2.50	4.00	-27.5	-25.00	4.18	5.13	0.000	1.881	36.667
Q3	9	21.41	1.20	21.40	-53.5	-25.00	6.00	6.00	0.000	1.265	21.083

Rear Electron Magnets

Chrom y 7.07 Chrom x 4.56 mom = 18

		L1 m	DL m	gap m	x cm	θ mrad	IR_1 cm	IR_2 cm	B T	Bpt T	Grad) T/m
Q1	3	5.300	1.200	0.50	0.0	0.00	6.60	7.50	0.000	1.035	-13.800
B1	5	7.000	2.000	0.50	0.0	0.00	7.88	9.38	0.180	0.000	0.000
Q2	7	9.500	1.000	0.50	0.7	5.30	10.46	11.73	0.000	1.150	9.804
B2	9	11.000	4.000	15.98	0.0	0.00	10.88	13.88	0.180	0.000	0.000
B3	11	30.984	5.200	0.50	35.4	6.97	6.00	6.00	-0.180	0.000	0.000

Comments

- I could try a Q2Re closer to Q1Re that would lower the chromaticity some more, but it will raise the gradients, so it may be useful to explore this version to see whether the magnets are ok.
- I have still tapered the magnets with constant gradients that have higher "pole tip" fields at the far end. I could taper the gradients keeping the "pole tip" fields constant. That moves the center of gravity closer to the IP which is also in the right direction, but I do not know what Steve would think of that.
- I still need to do some checking of the apertures. They seem larger than they need be for this case, but I have not checked other cases yet.
- So this is a DRAFT. I will look at other options hopefully next week.