

Post pCDR IR v3

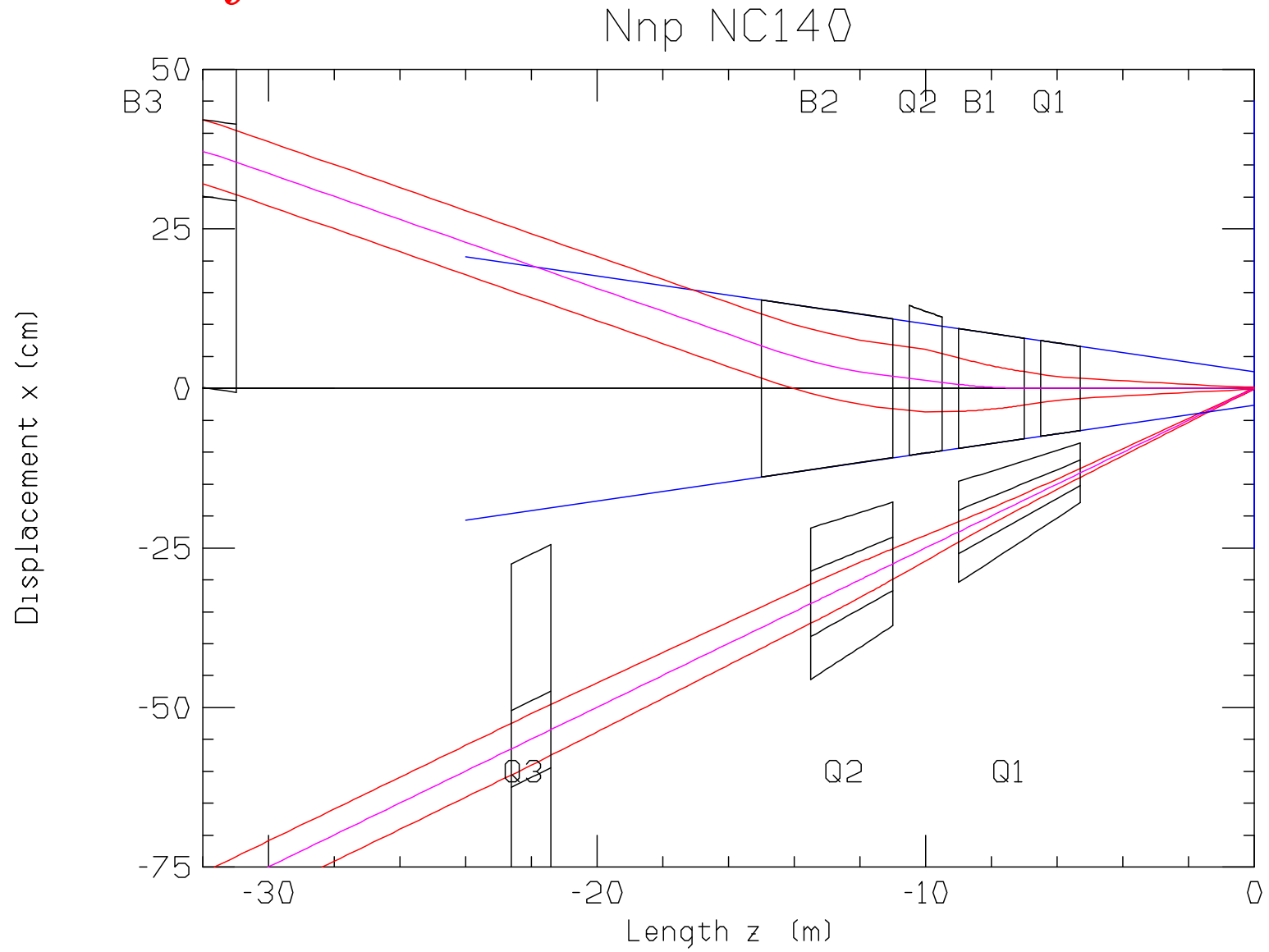
6/8/18

R.B.Palmer

Alternative A

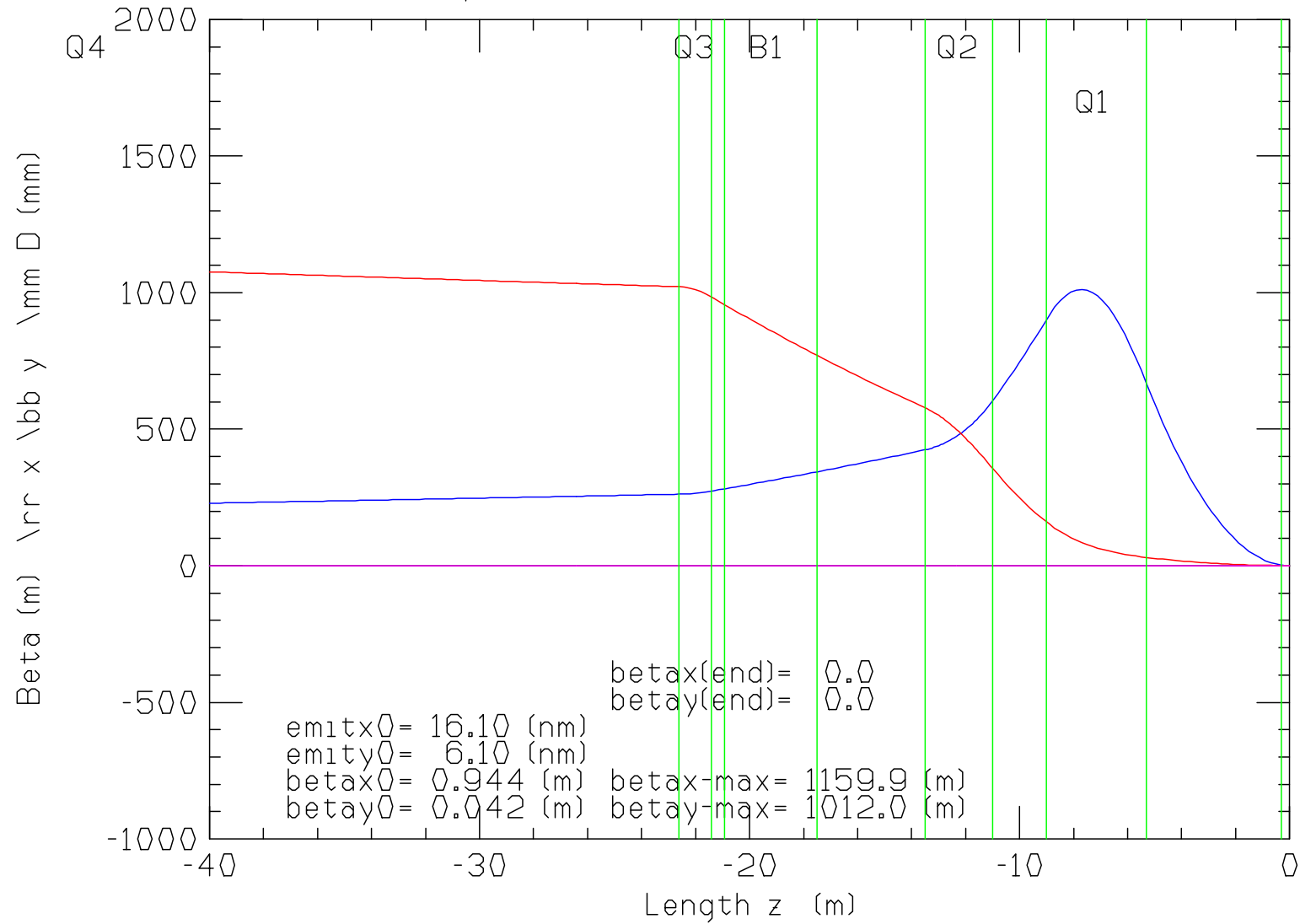
- Crossing at 25 mrad (22)
- start e quads at $4.5 + 0.8 = 5.3$ m (5.5) 80 cm warm to cold
- Q1Re length 1.2 m (3.42) Shorter to reduce chromaticity
- Q2Re length 2 m (2.57) Shorter to reduce chromaticity
- Start p quads at 5.3 m (5.5) 80 cm warm to cold
- Q1Rp length 3.7 m (3.42) \approx same
- Q2Rp length 2.5 m (2.57) \approx same
- e Chrom = x/y 4.3/7.1 (6.3/7.7) Reduced
- e Beta max = x/y 465/434 (900/589) Reduced

Rear Layout A



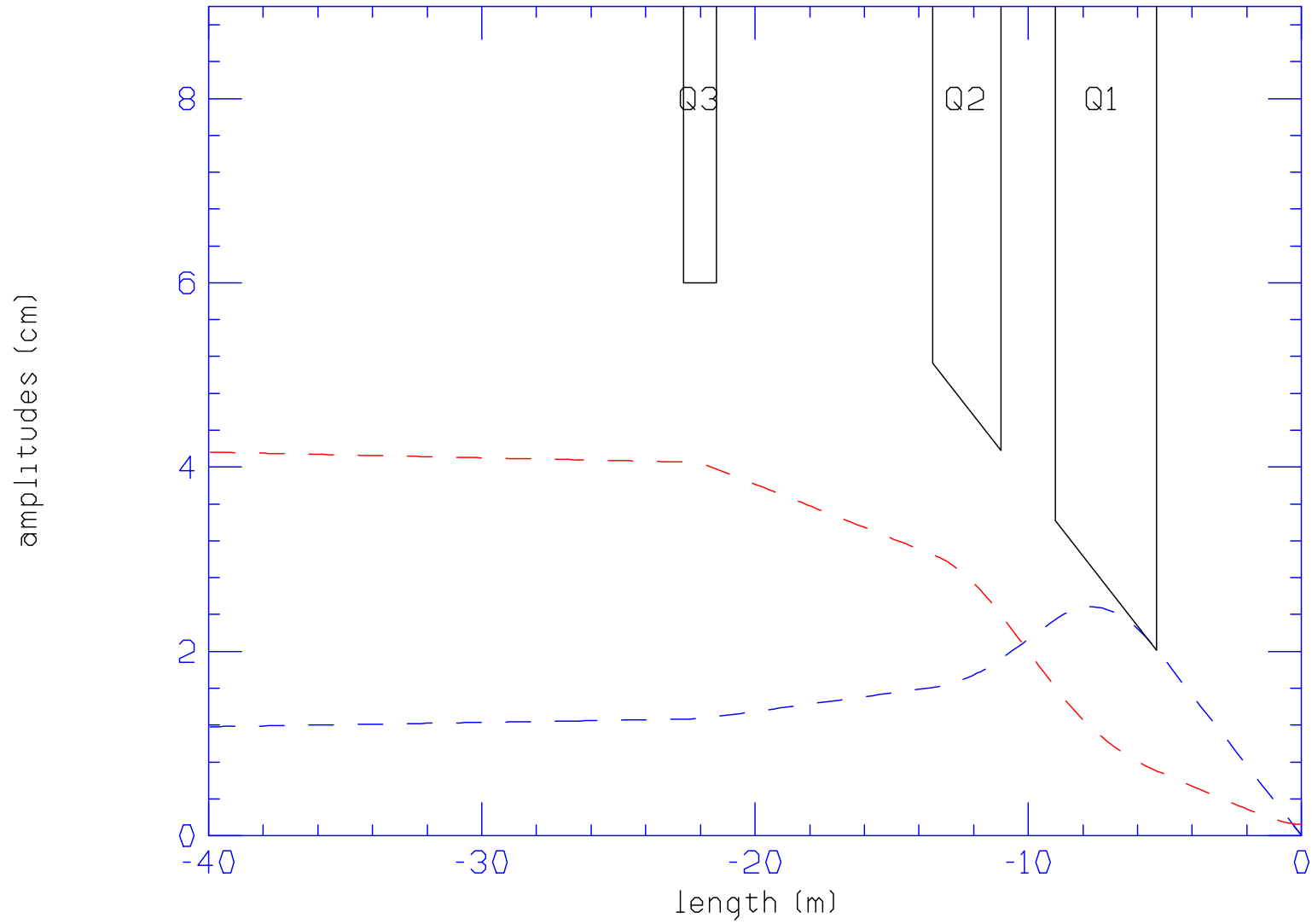
Rear p betas

Nnp NC140 Div = 3 Hadrons



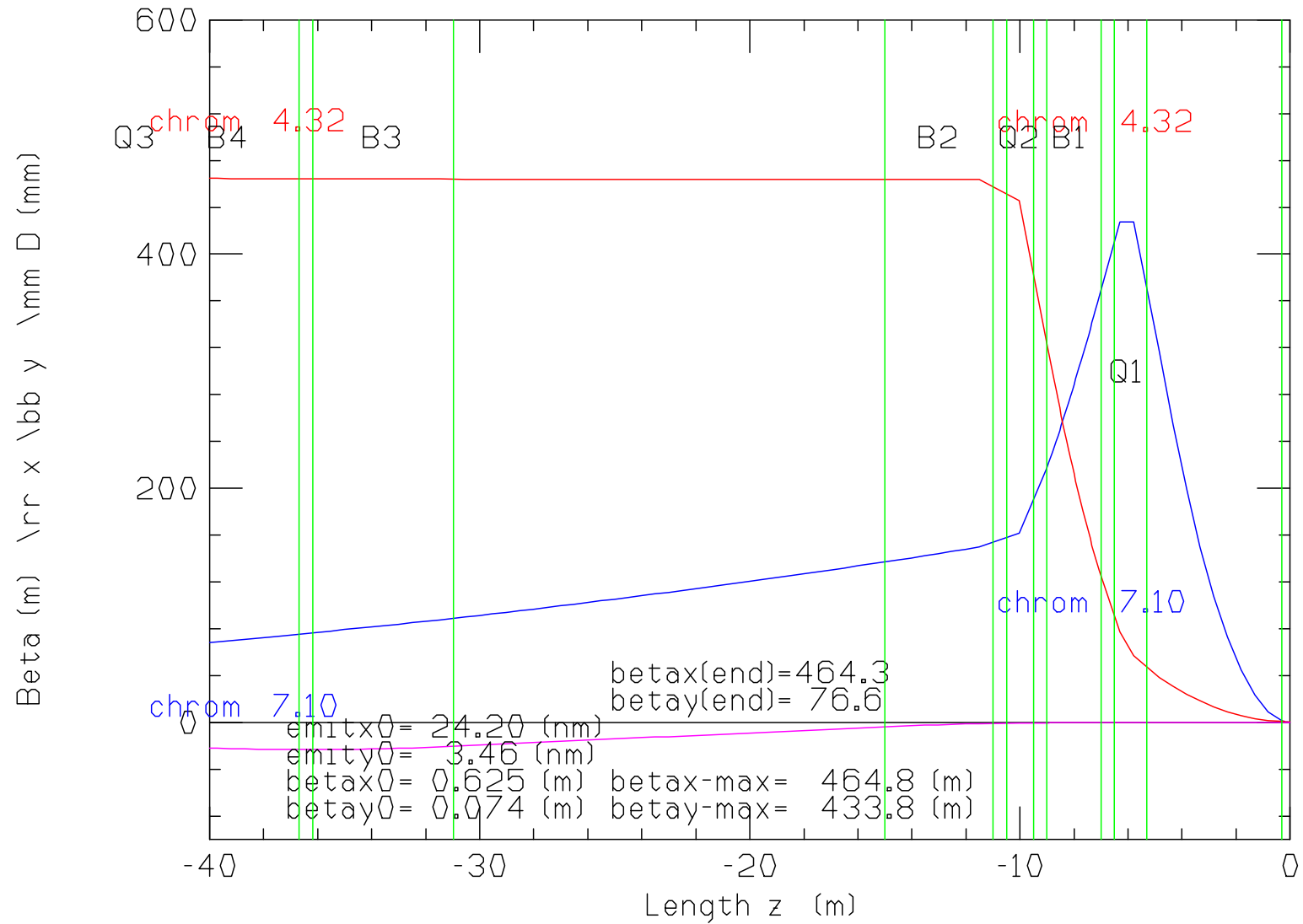
Rear p amps

Nnp NC140 Div = 3 Hadrons

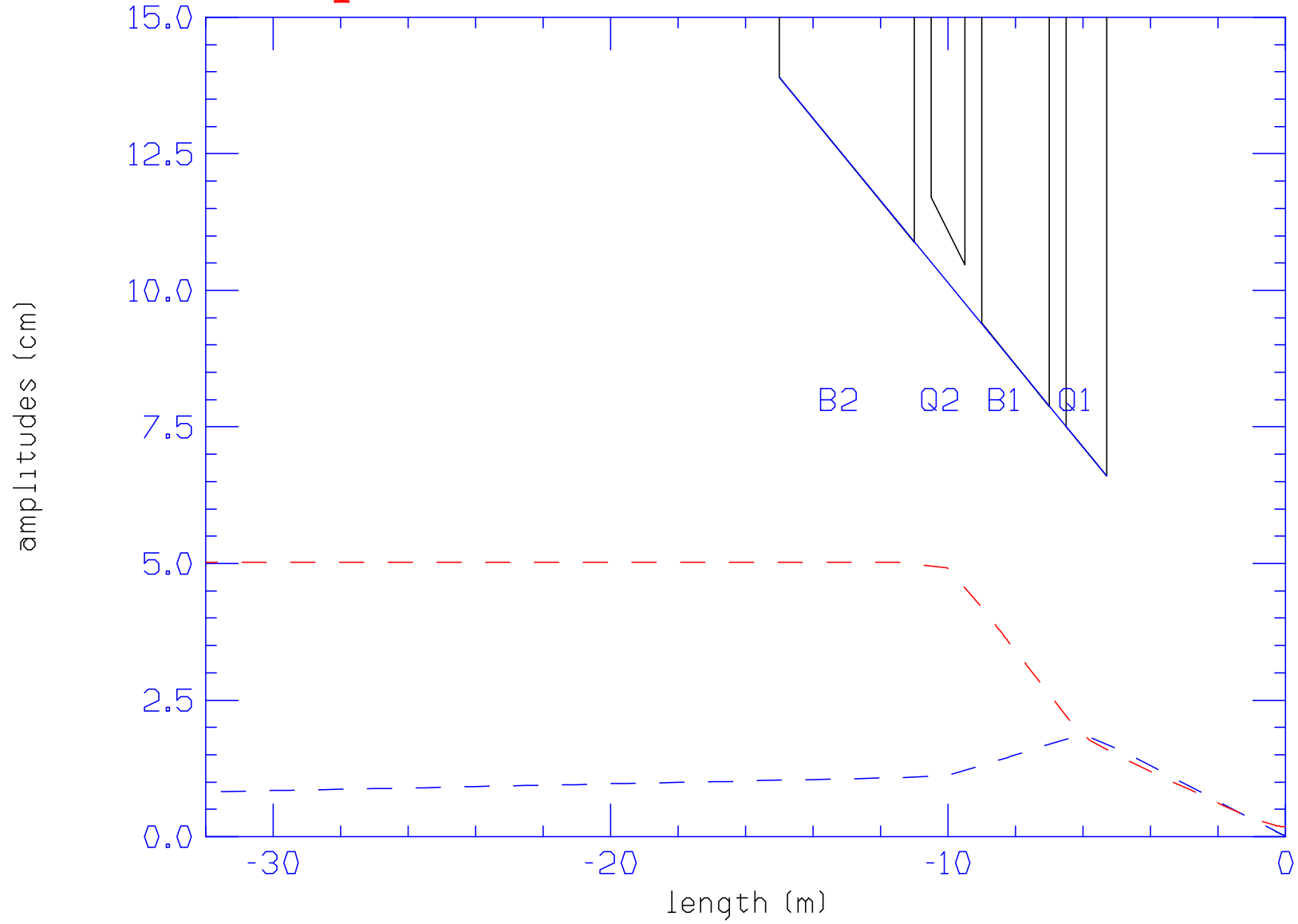


Rear e betas A

Nne NC140 Div = 3 Hadrons



Rear e amps A



Rear Proton Magnets

Chrom y 13.26 Chrom x 6.57 mom = 275

		L1	DL	gap	x	θ	IR ₁	IR ₂	B	Bpt	Grad)
		m	m	m	cm	mrاد	cm	cm	T	T	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 A

Chrom y 7.07 Chrom x 4.56 mom = 18

		L1	DL	gap	x	θ	IR ₁	IR ₂	B	Bpt	Grad)
		m	m	m	cm	mrاد	cm	cm	T	T	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.

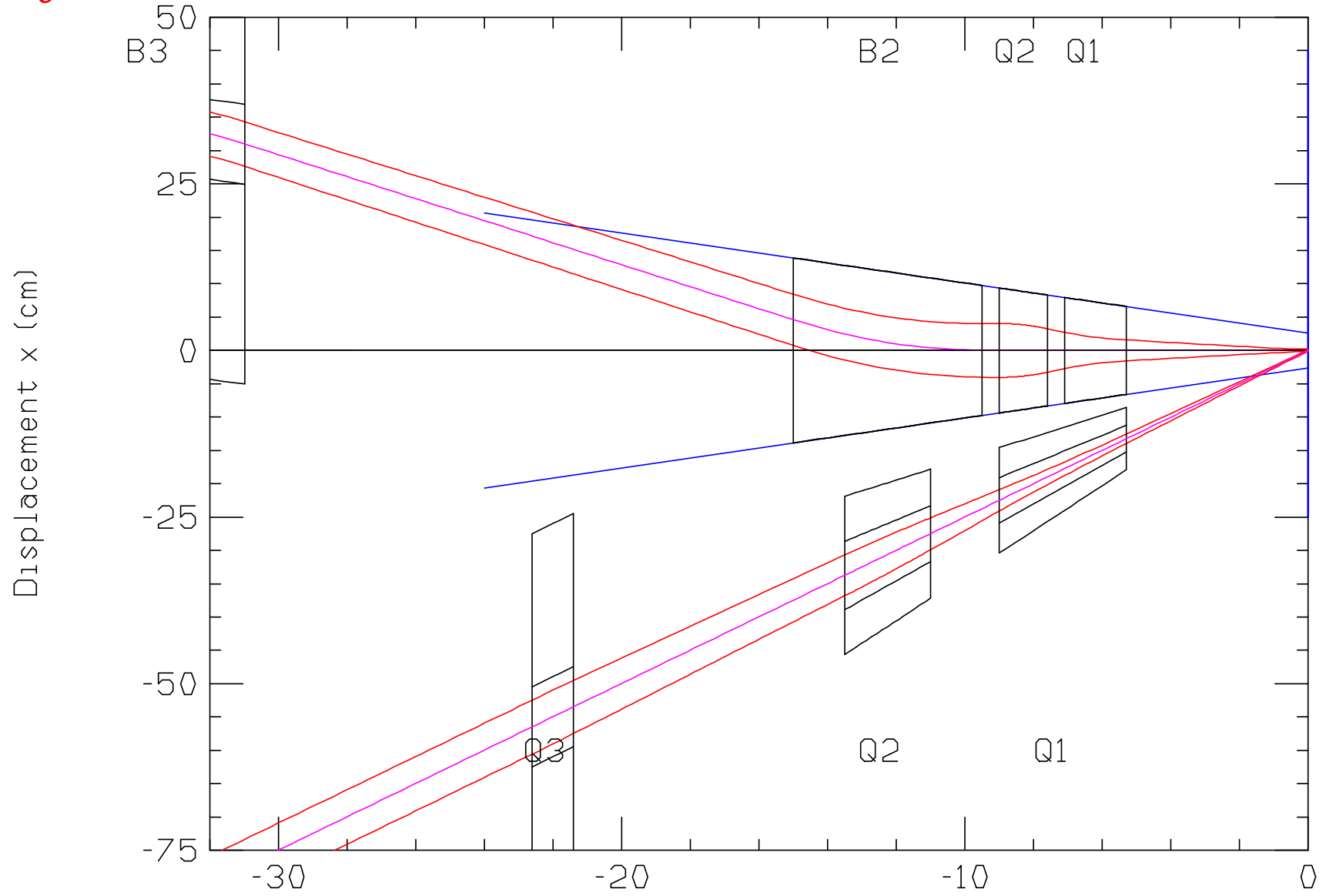
Done see below

- 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.

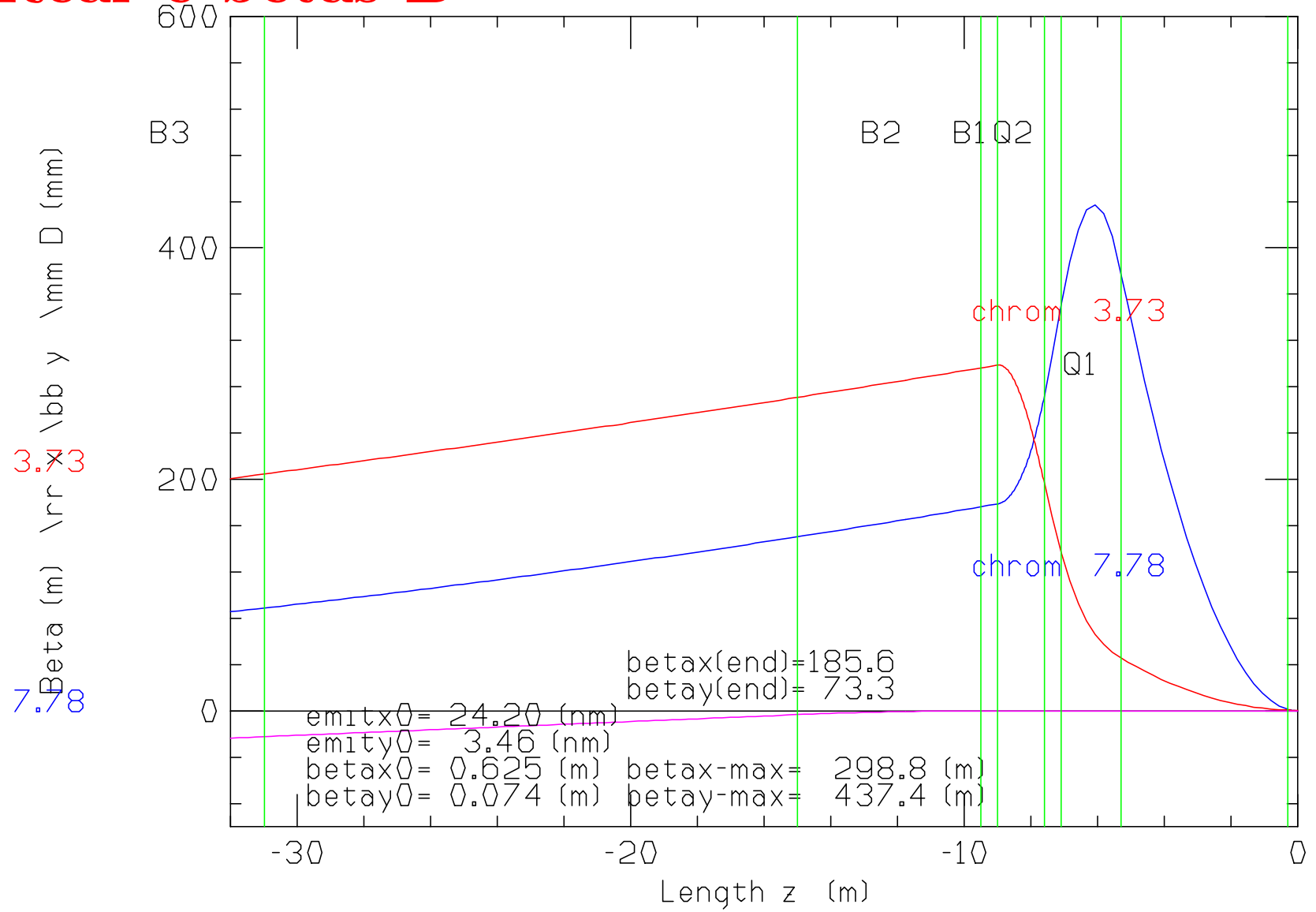
Alternative B

- 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)
- e Chrom= x/y 3.7/7.8 (4.3/7.1) (6.3/7.7)
- e Beta max= x/y 300/437 (465/434) (900/589)

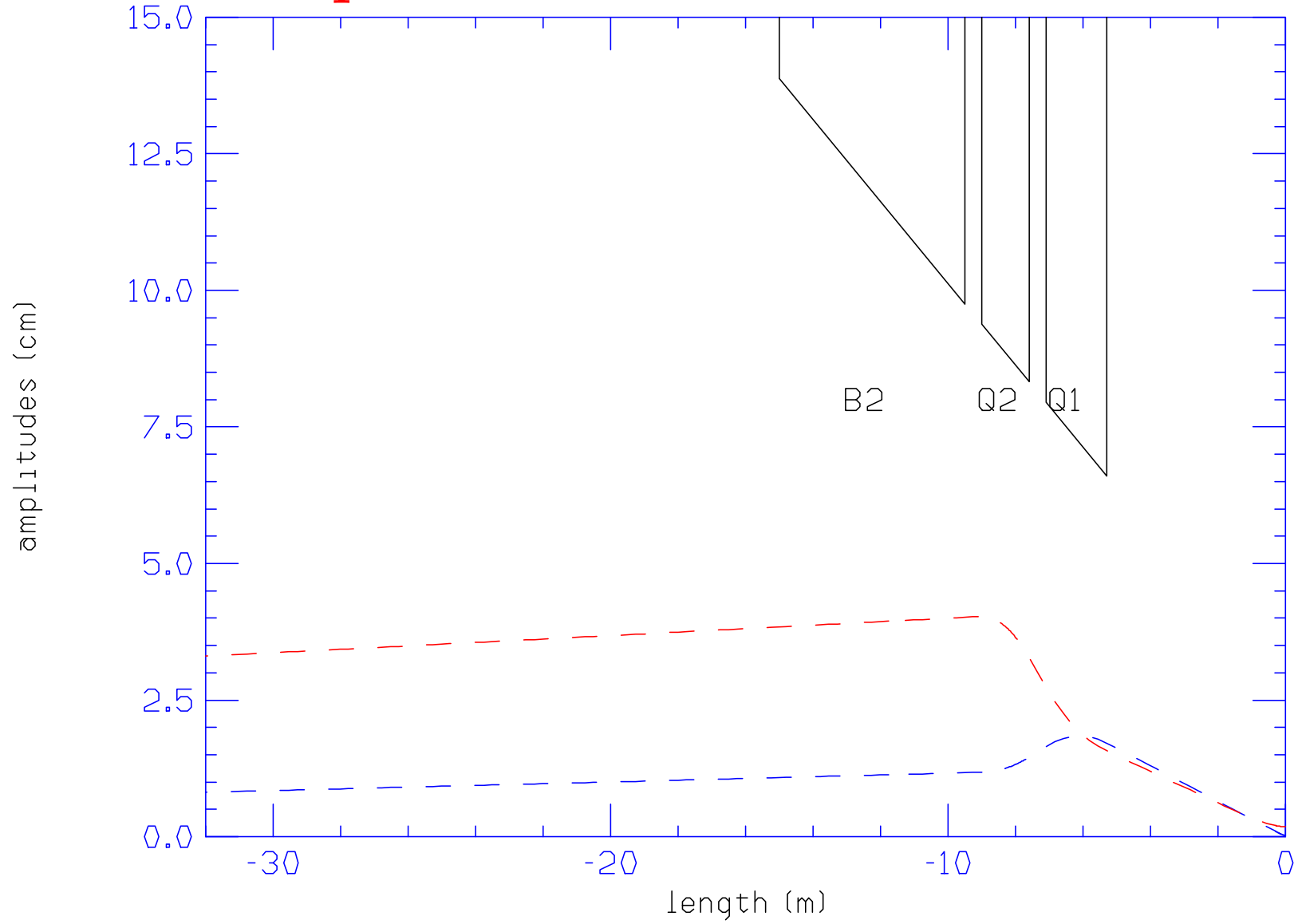
Layout B



Rear e betas B



Rear e amps B



Electron Magnets B

Chrom y 7.75 Chrom x 3.81 mom = 18

	L1	DL	gap	x	θ	IR ₁	IR ₂	B	Bpt	Grad)	
	m	m	m	cm	mrاد	cm	cm	T	T	T/m	
Q1	3	5.300	1.800	0.50	0.0	0.00	6.60	7.95	0.000	1.026	-12.900
Q2	5	7.600	1.400	0.50	0.0	0.00	8.32	9.38	0.000	1.181	12.600
B2	9	9.500	5.500	15.98	0.0	0.00	9.75	13.88	0.180	0.000	0.000

- "Pole tip" fields no worse than v1: 1.02 1.18 (1.03 1.15)
- x chromaticity less but y chromaticity more 3.7/7.8 (4.3/7.1)