Valencia, 17/10/2006

Q0 with L*=13m

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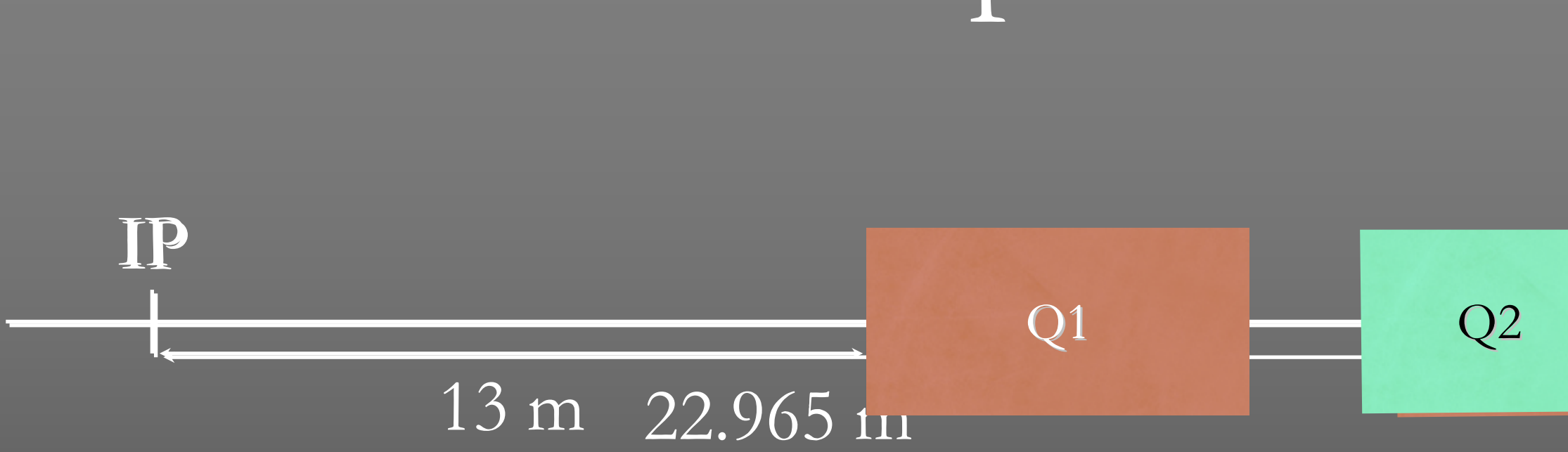
-	General considerations on the existing Triplet with L*=13
-	Q0 with L*=13 m
-	Conclusions
-	Next works

Moving the existing triplet to 13 meters from the IP could be a way to decrease the value of β*

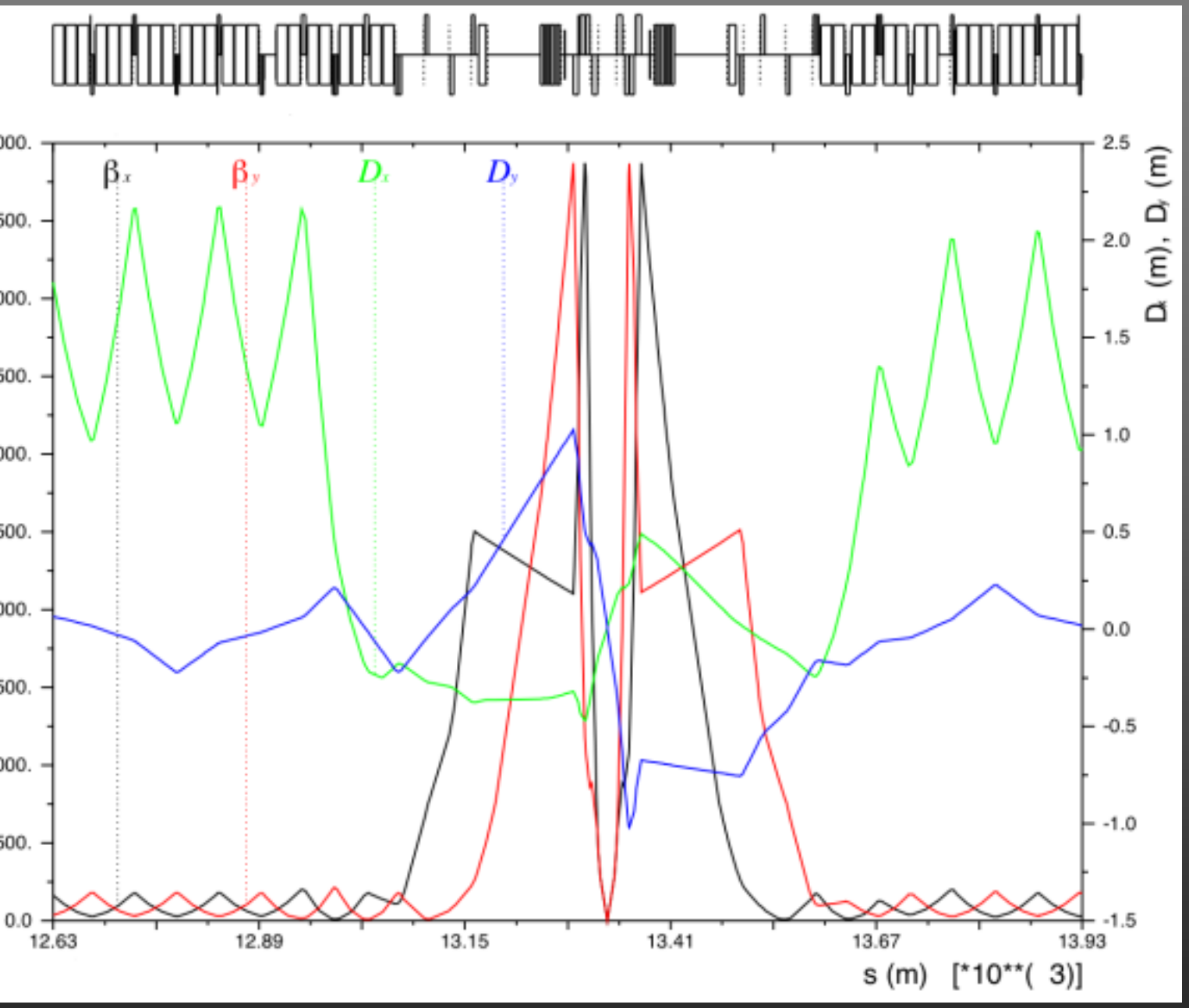
but

a first analisys shows that, if we want to preserve the size of the triplet, an increase in gradient or in aperture is mandatory.



$L^* = 13$ m

$\beta^* = 0.25$ m

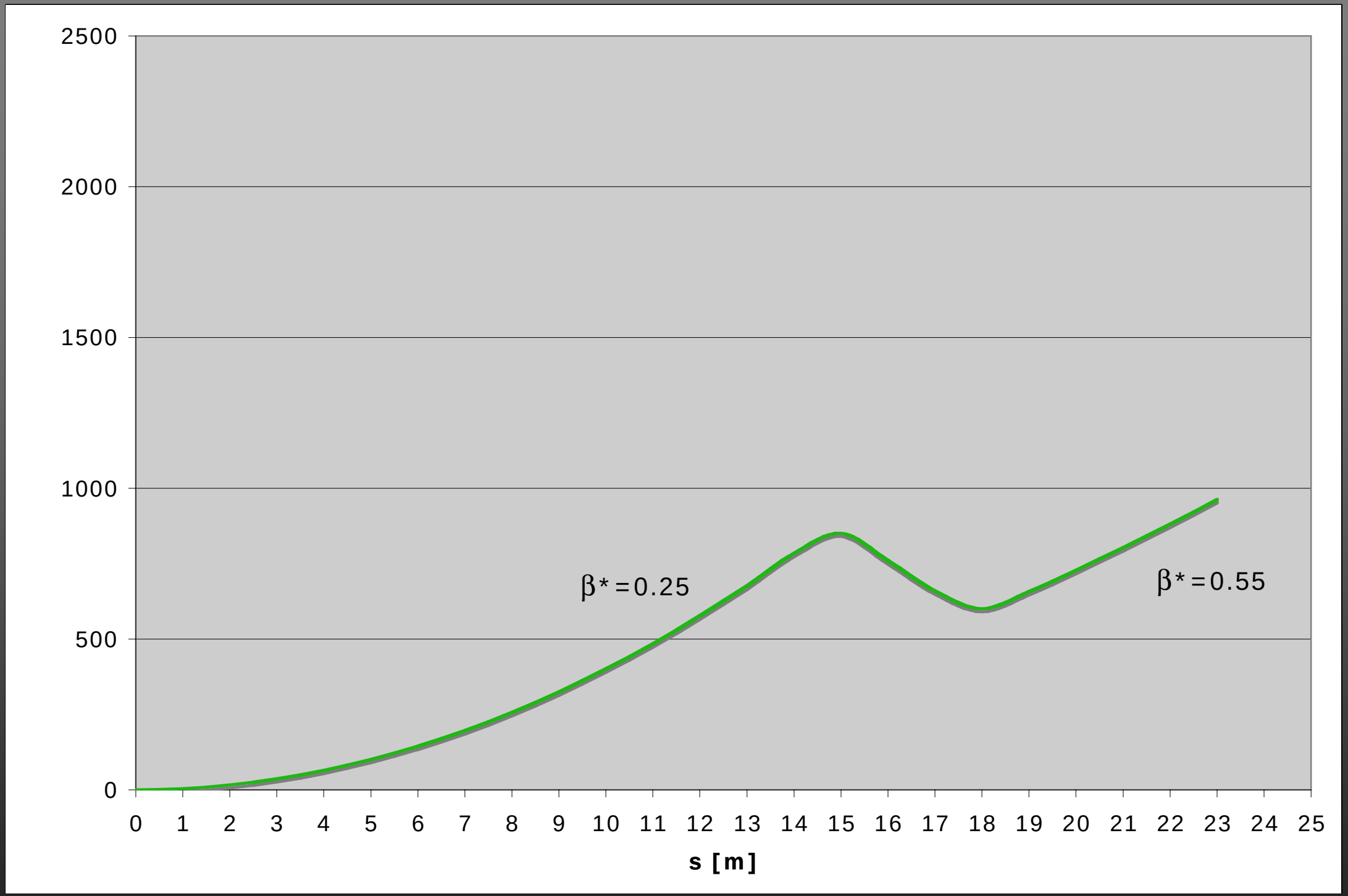


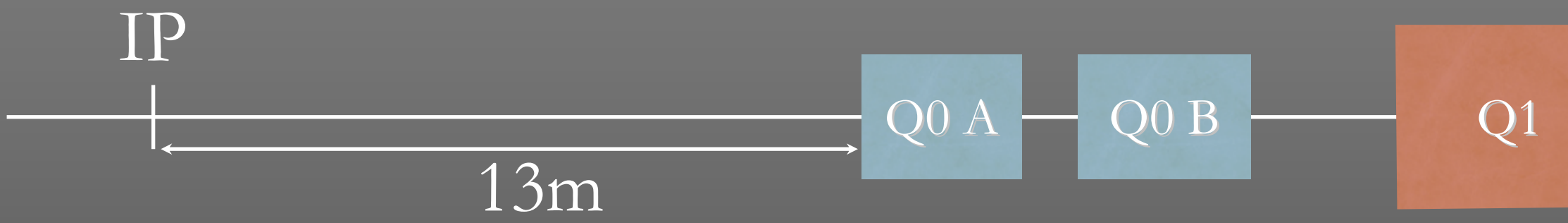
L*=13 m
β*=0.25 m
β Max=4900 m
Ø=75 mm
G=275 T/m

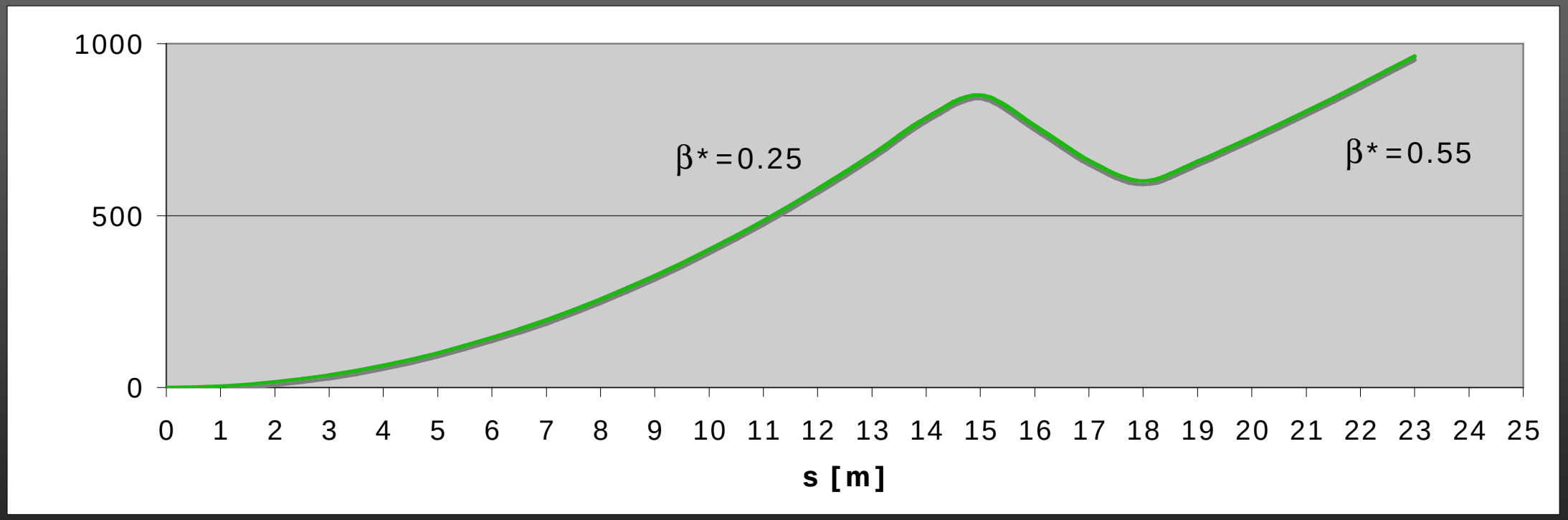
A quadrupole with a diameter of 75 mm and a gradient of 275 T/m is far from the limits of nominal LHC IR magnets.

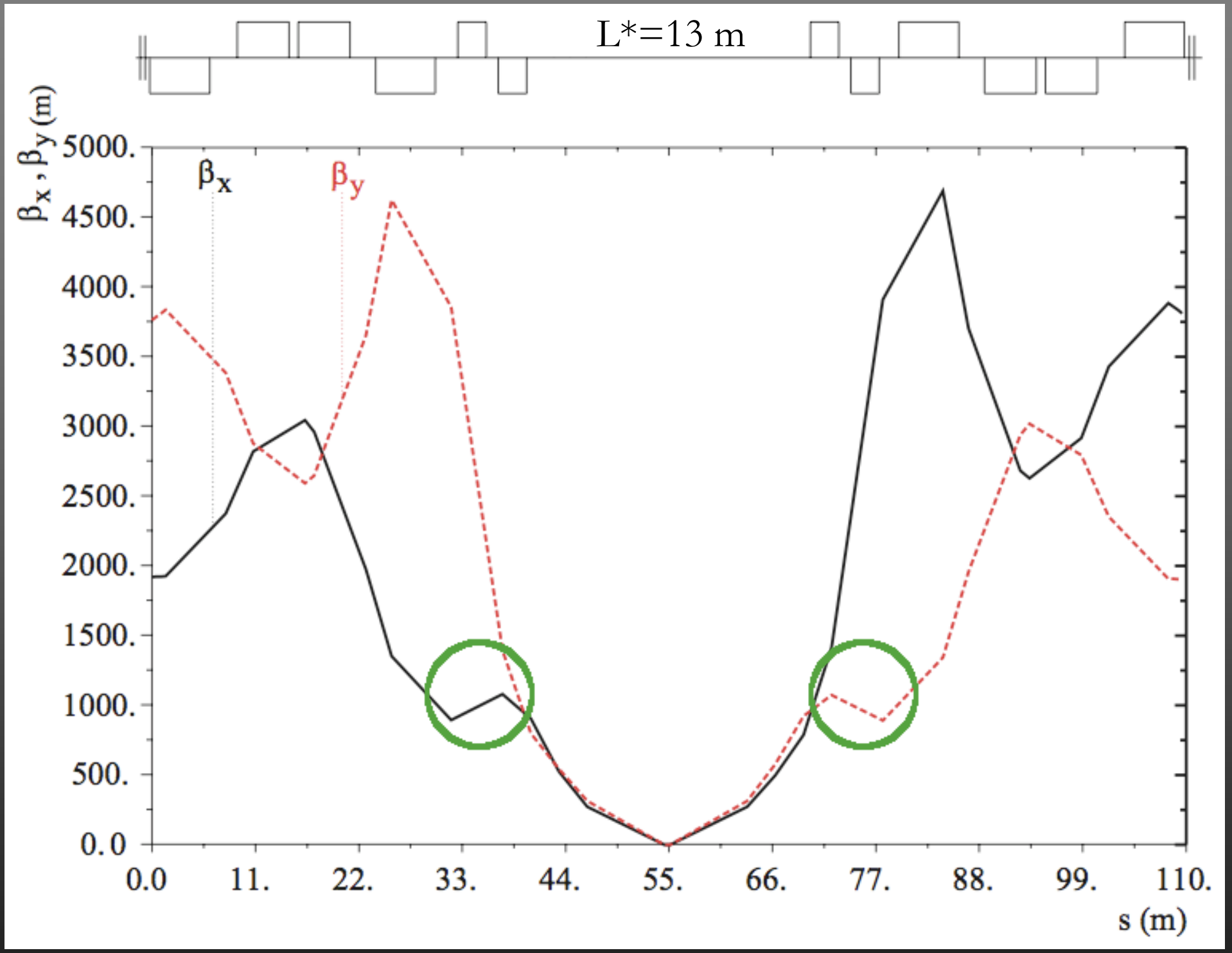
It also seems to be far from the limits of the NbTi technology.

Is there any way to reduce β^* without introducting new technology (Nb_3Sn) or a completely new design of the Triplet?


2500
2000
1500
1000
500
0
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25
s [m]
β* = 0.25
β* = 0.55


IP
13m
Q0 A
Q0 B
Q1


1000
500
0
β* = 0.25
β* = 0.55
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25
s [m]


L*=13 m
β_x , β_y (m)
5000.
4500.
4000.
3500.
3000.
2500.
2000.
1500.
1000.
500.
0.0
β_x
β_y
0.0
11.
22.
33.
44.
55.
66.
77.
88.
99.
110.
s (m)

Magnet	Length	Min. Diameter	Gradient
Q0 A	3 m	> 40 mm	165 T/m
Q0 B	3.5 m	> 40 mm	165 T/m

* E. Laface, R. Ostojic, W. Scandale, D. Tommasini,
"Interaction region with Slim Quadrupoles". Proceedings of EPAC 2006.

-	Low β* solution with NbTi
-	Slim quadrupoles with small apertures and gradients
-	Easier integrability into experiments due to the small size and weight of magnets

-	Full integration with nominal lattice
-	Injection solution and transition between collision and injection
-	Study of energy deposition