R.Appleby, LCWS2004

Set-up for TESLA at E_{cms} = 500 GeV

Super-Q with large bore

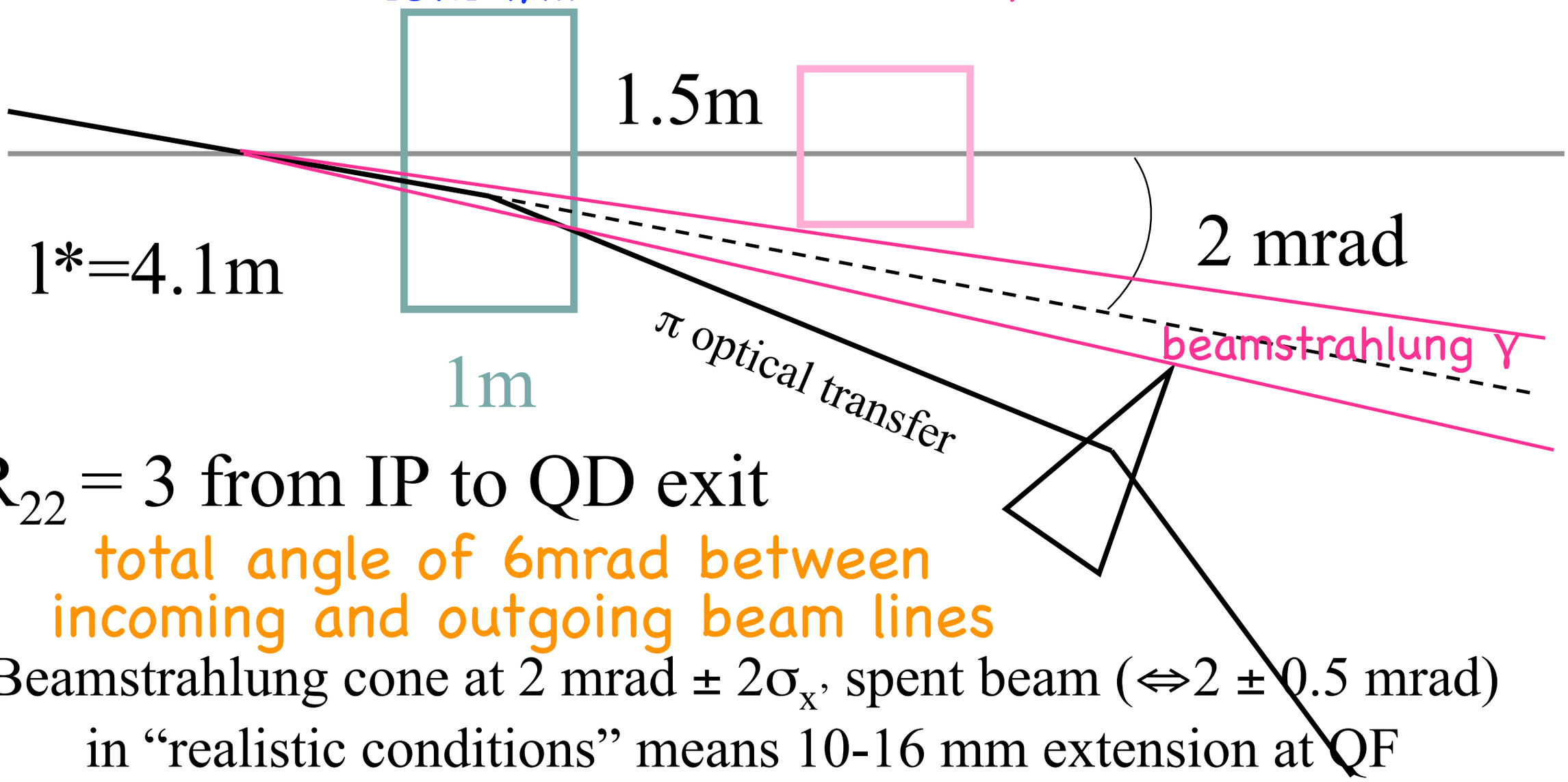
Conventional Q

QD (r=24mm)

QF (r=7mm)

-187.1 T/m

224.2 T/m



$R_{22} = 3$ from IP to QD exit

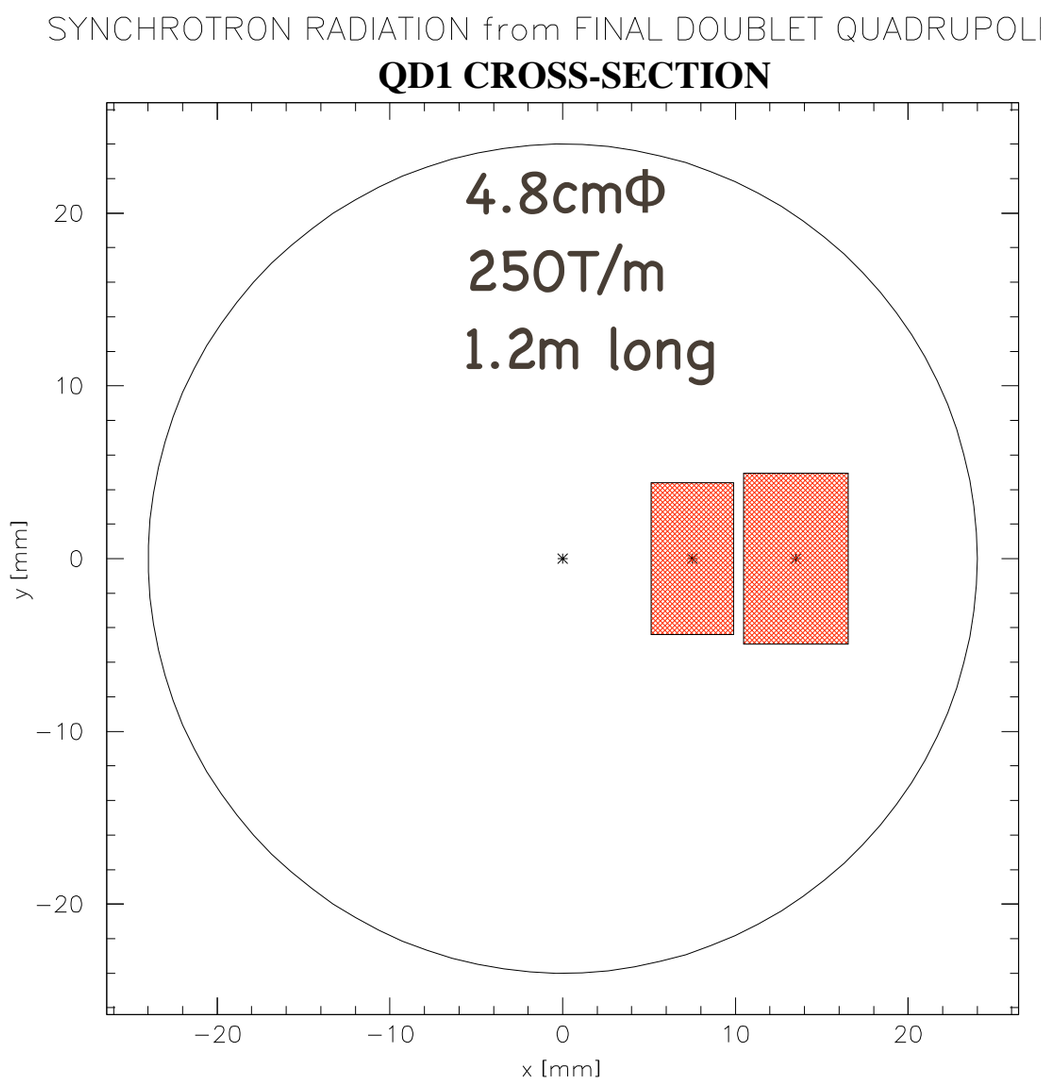
total angle of 6mrad between incoming and outgoing beam lines

Beamstrahlung cone at 2 mrad ± $2\sigma_x$, spent beam ($\Leftrightarrow$2 ± 0.5 mrad) in "realistic conditions" means 10-16 mm extension at QF

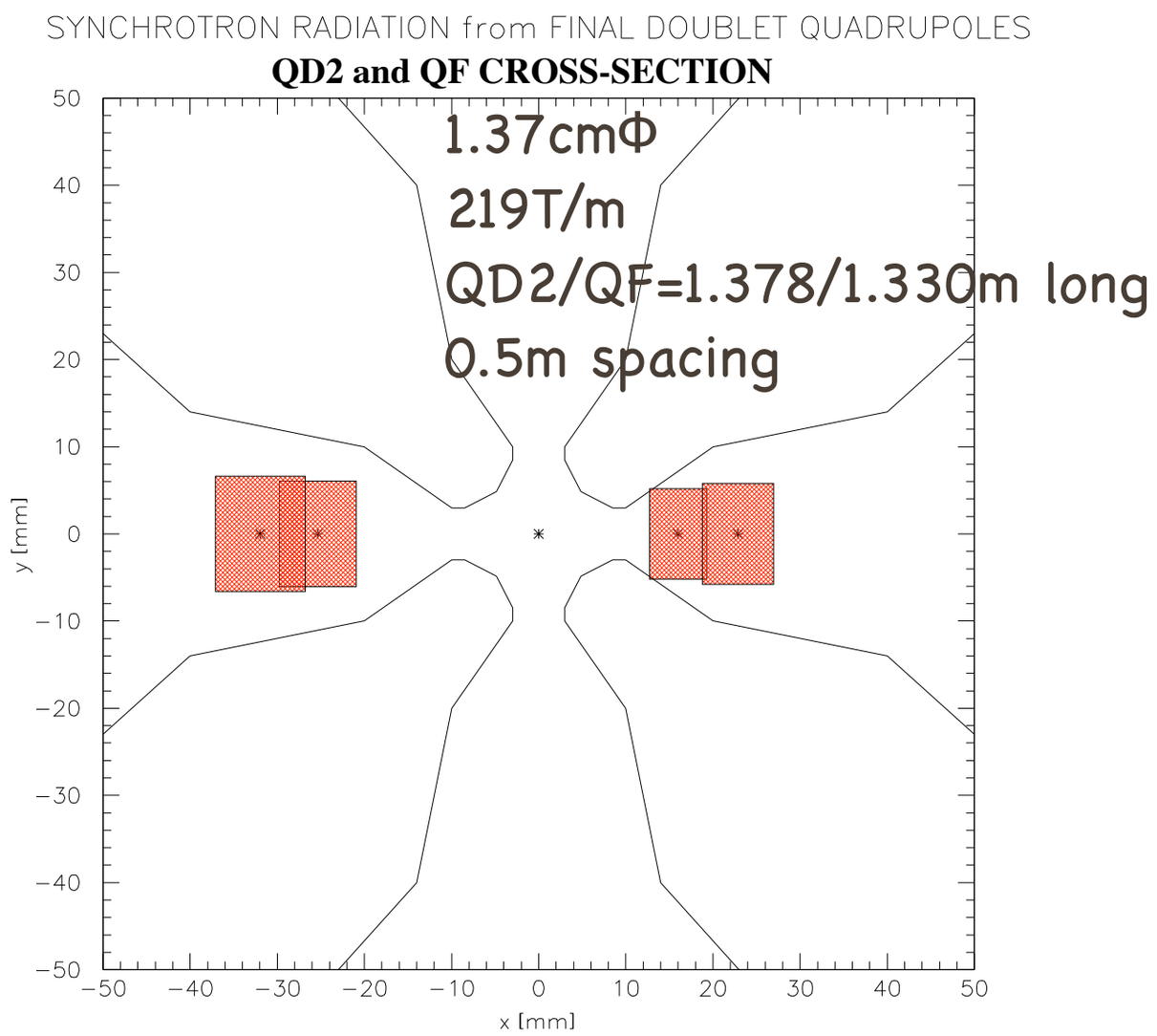
CLIC Final Focus Design

by O. Napoly, 10 December 1997

5mrad crossing and L*=1.5m



(a)



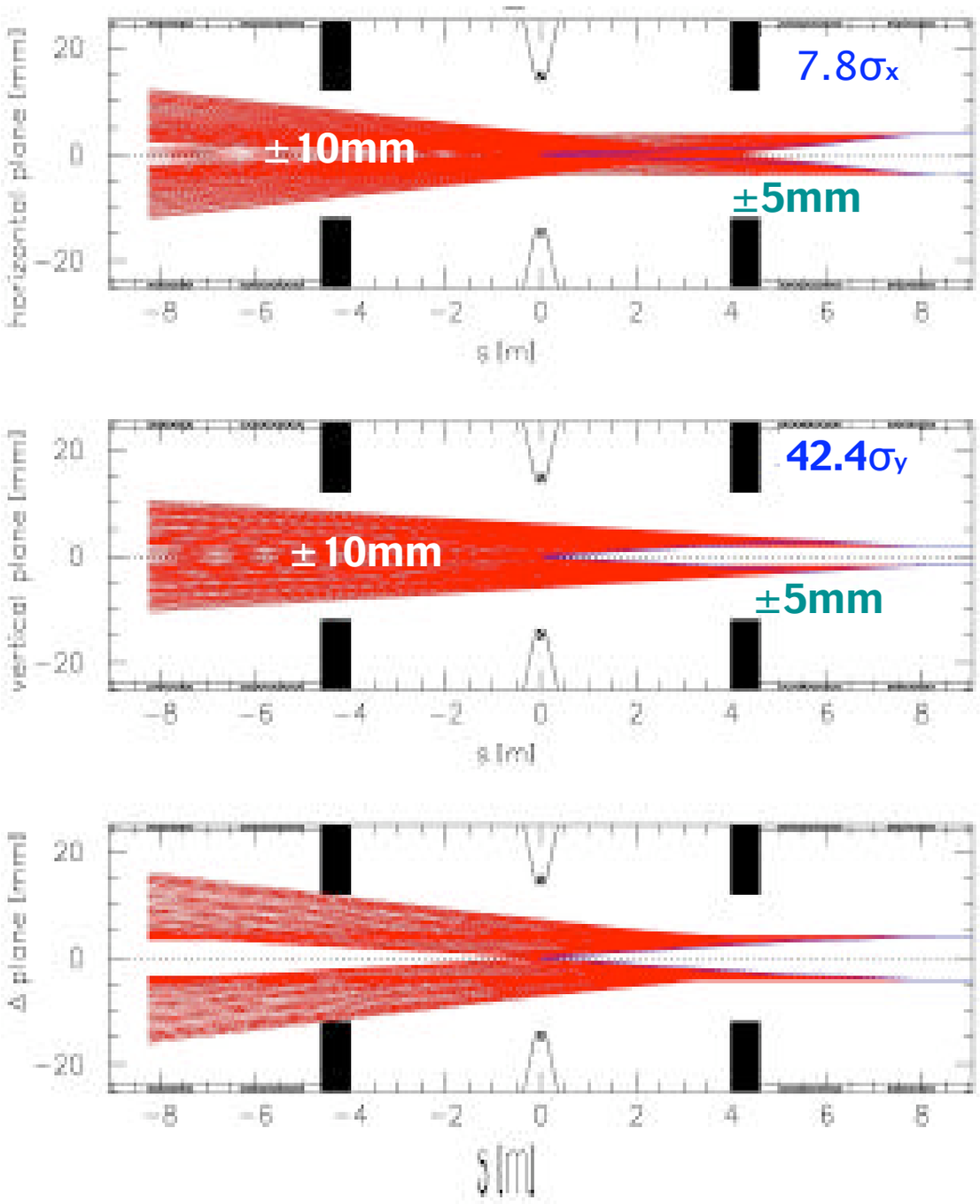
(b)

Figure 5: Transverse profiles of the synchrotron radiation at the entrance (small rectangle) and exit (large rectangle) faces of : (a) QD1, (b) QD2 (right) and QF (left) in the extraction line.

Final doublet of "TESLA: 2mrad crossing scheme"

Element	k1 (1/m)	Length (m)	B (T)	r (mm)	gradient (T/m)
QF	0.2621043	0.974	1.569	7	224.2
drift		1.5			
QD	-0.2997925	1.335	-4.490	24	-187.1
L*		4.1			
IP					

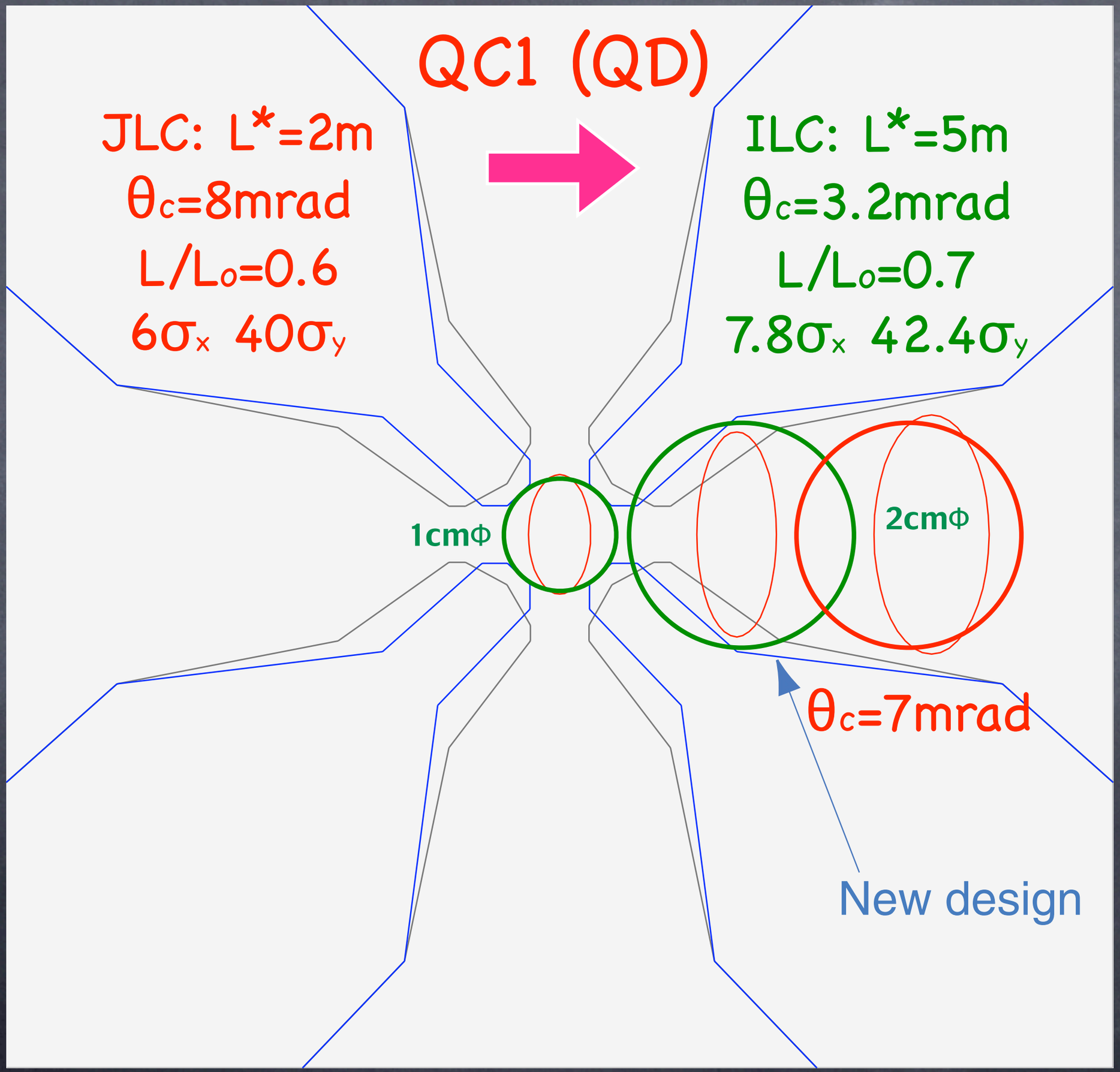
Halo Collimation



- VTX with r = 14 mm requires mask with r = 12 mm
- collimation required:
  - x: 7.8σ [TDR 13σ]
  - y: 42.4σ [TDR 81σ]
- Collimation requirements about a factor 2 tighter!
- Collimator wakefields?
- Reconsider choice of L*
- Tail folding octupoles

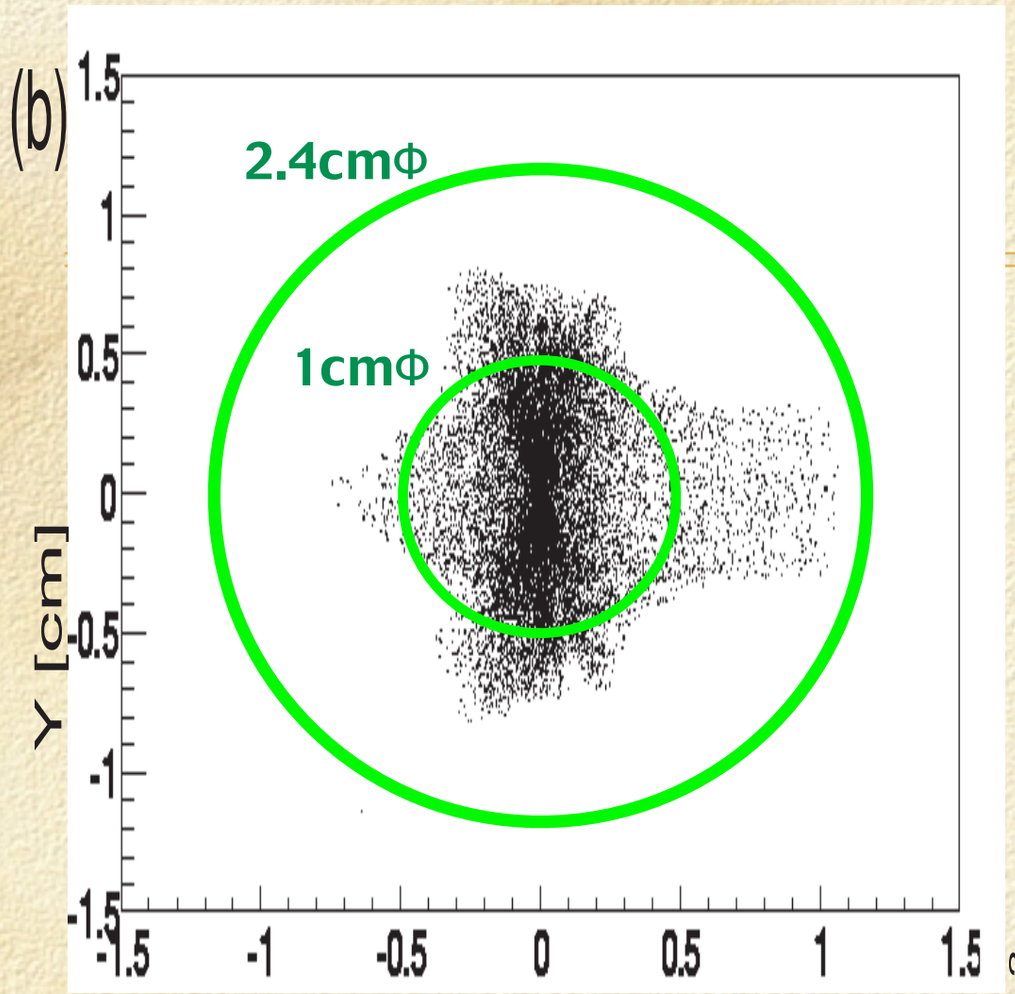
Revival !

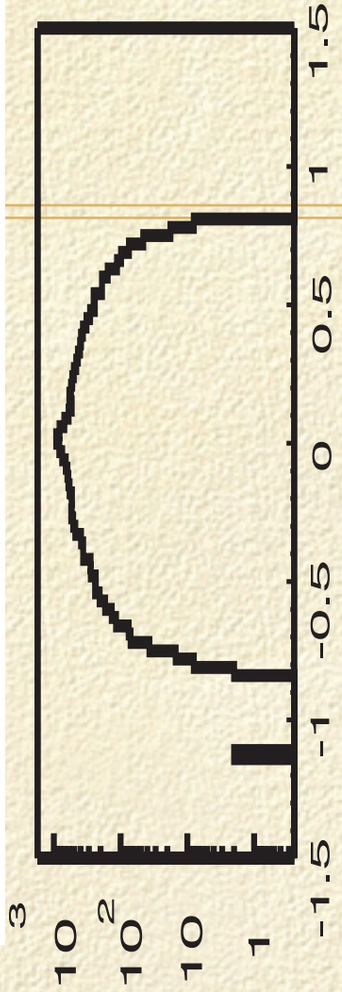
A. Miyamoto, June 2000

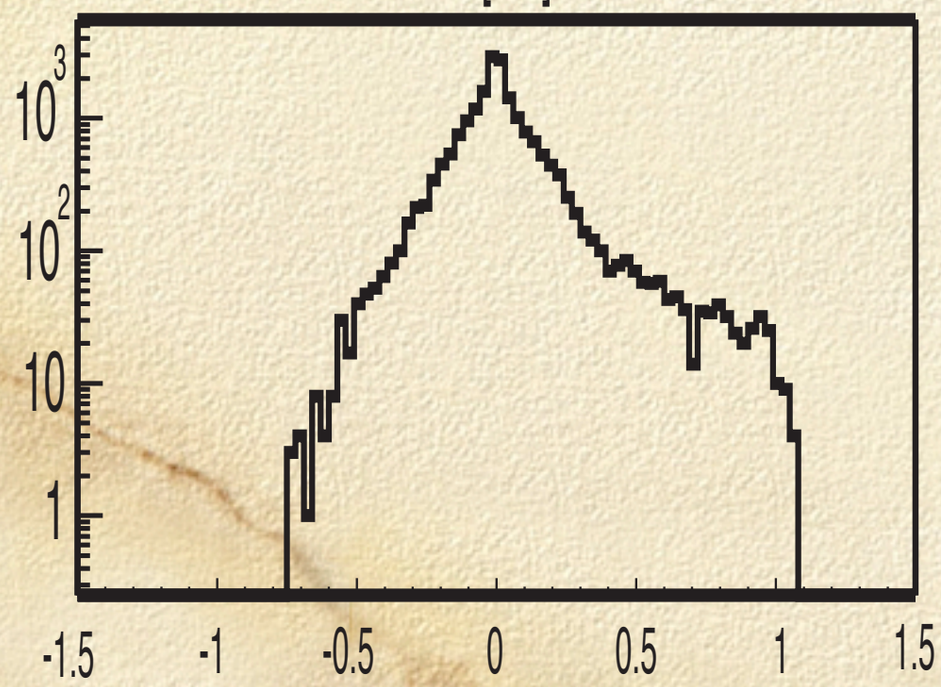


Background : Synchrotron Radiations

BDS-Simulation (GEANT4) by K.Tanabe







from Halo at IP

<E>=4.8MeV

GLC: L^*=3.5m

θ_c=7mrad

L/L_0=0.6

$12\sigma_x$ $53\sigma_y$