

XCC Crossing Angle Dependence for Configs with No Deflection Beams

Tim Barklow

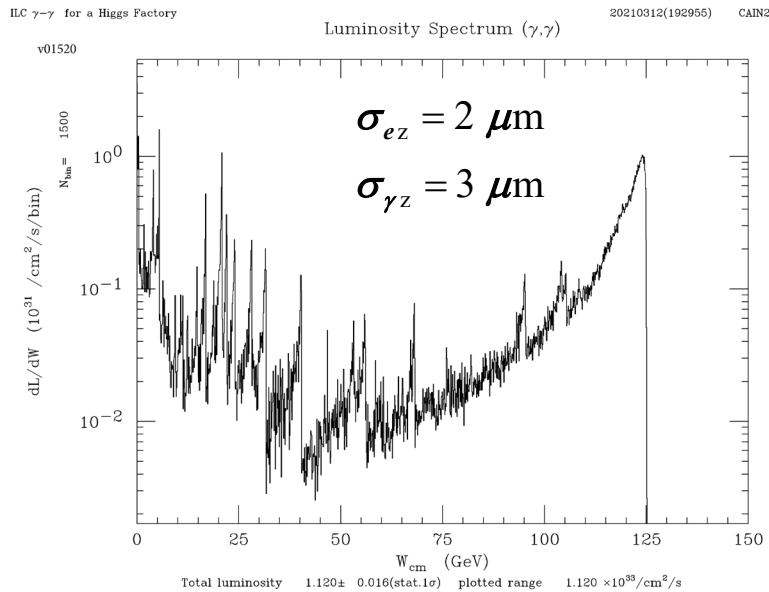
XFEL $\gamma\gamma$ Collider Meeting

Apr 07, 2021

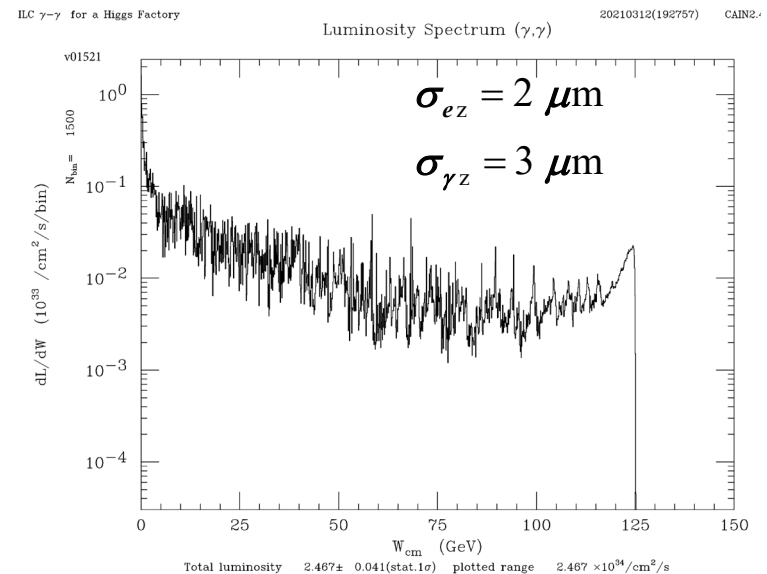
For configs with few microns rms bunch length for both 62.5 GeV and 30 GeV e- beams, the beamstrahlung luminosity is not so bad at 0 crossing angle. Perhaps then we don't need deflector beams in such cases.

However, there is unexplained increase in beamstrahlung lumi with these configs when going from 0 to 14 mrad cross angl

0 mrad crossing angle



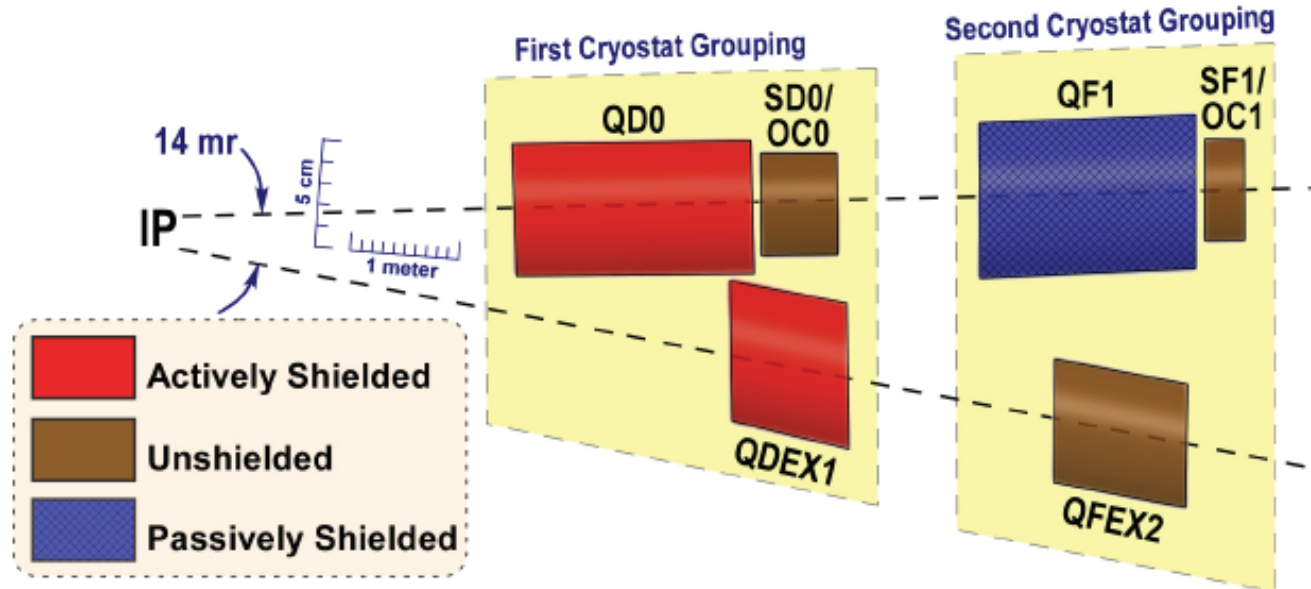
14 mrad crossing angle



Energy absorbed by SC QD0 should be no more than 1 Watt

ILC:

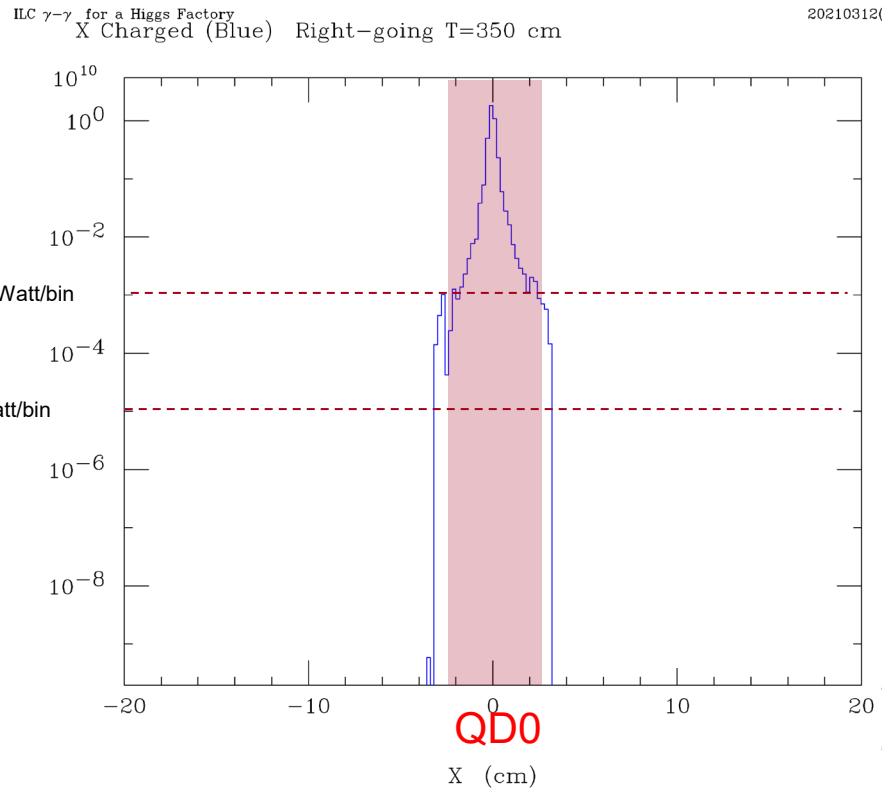
Figure 8.7
Schematic layout of
magnets in the IR.



Energy absorbed by SC QD0

0 mrad crossing angle

XCC



QD0 = final quad for 62.6 GeV beam

e- Energy vs X at QD0 faces (350 cm from IP)

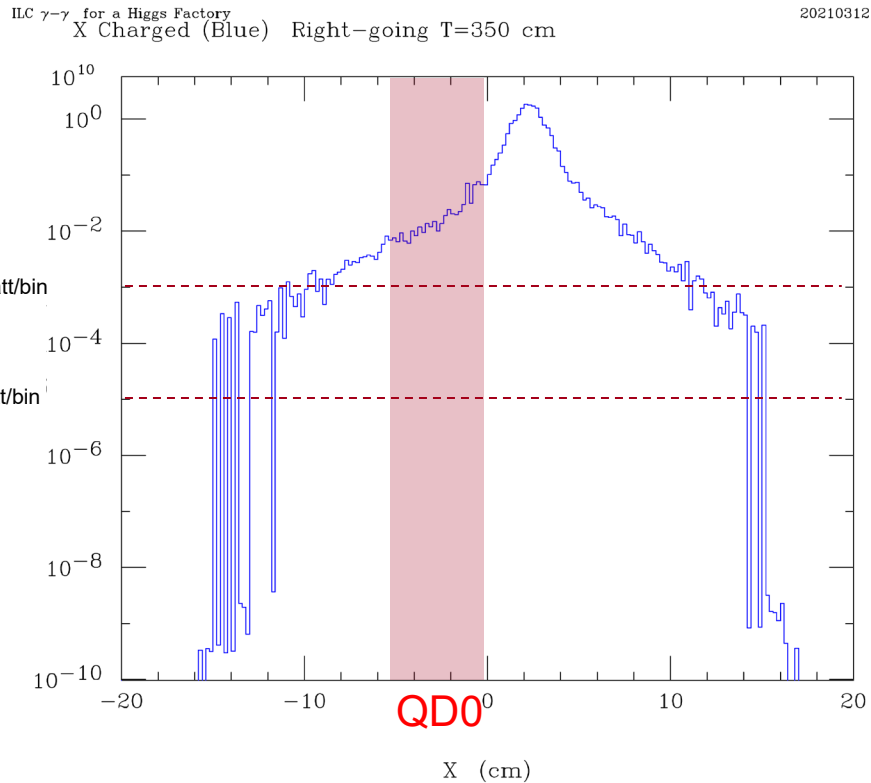
From this plot it looks like
a 14 mrad cross angle should
be sufficient to avoid QD0

But ...

Energy absorbed by SC QD0

14 mrad crossing angle

XCC



QD0 = final quad for 62.6 GeV beam

e- Energy vs X at QD0 faces (350 cm from IP)

Electrons are spread out over a much wider range of angles once the crossing angle is introduced.