Beam Crossing Angle

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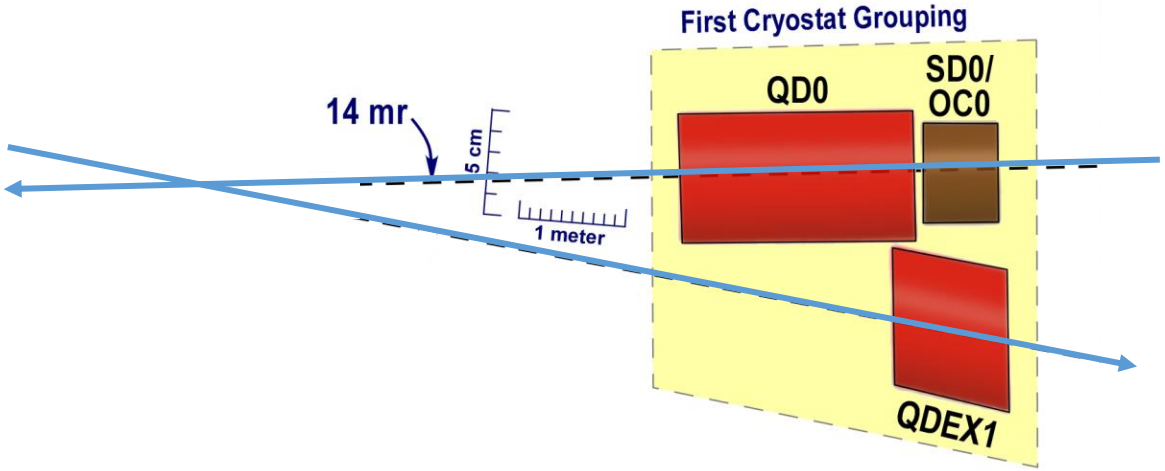
Beam Crossing Angle at LCWS13

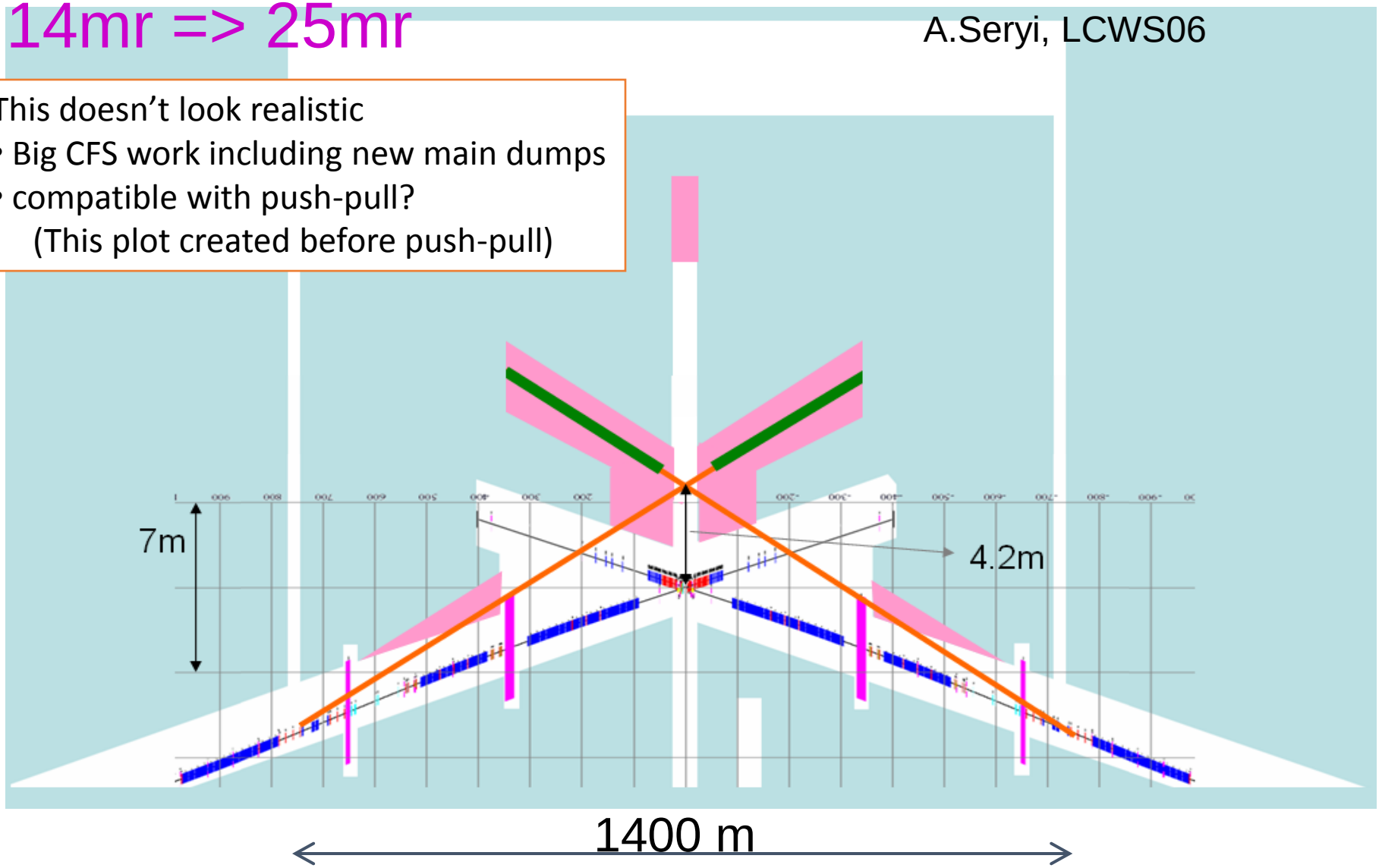
- TDR
  - 14 mr
- γγ Collider
  - 25 mr
  - 20 mr possible but ½ luminosity
- Two beam collider,,,
  - 20mr



14mr => 25mr

A.Seryi, LCWS06

This doesn't look realistic
- Big CFS work including new main dumps
- compatible with push-pull?
  (This plot created before push-pull)



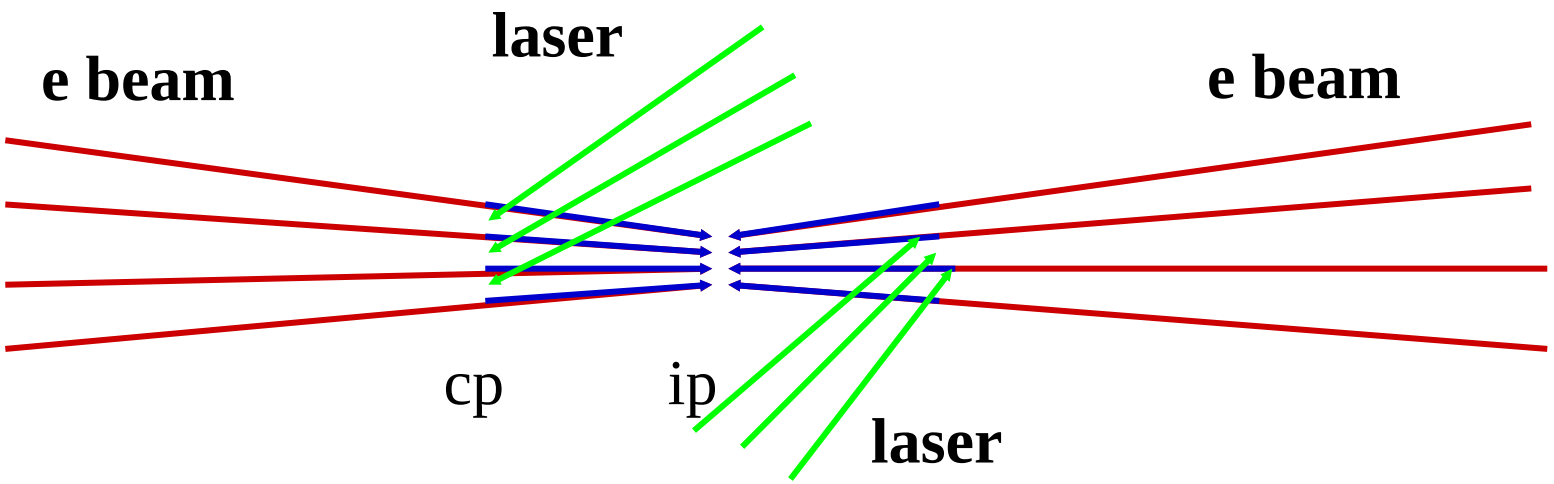
- additional angle is 5.5mrad (=(25-14)/2) and detector need to move by about 3-4m

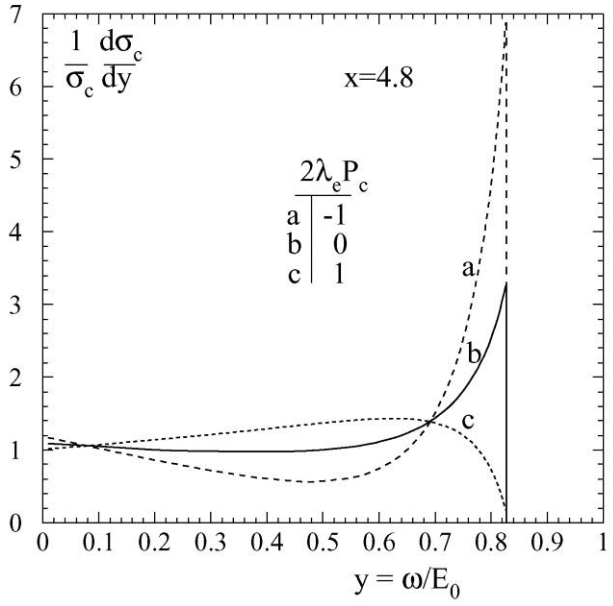
Issues for larger angle

- Physics/Detector/MDI
  - 20 mr or 25 mr or ,,,
  - minimum veto angle
  - angle between detector solenoid and beam
  - extraction line (compatibility with the γγ?)
  - compatibility with the push pull
  - ,,,,,
- Accelerator
  - modification of the tunnel design

Why we want it ? ,,,,,, we have TDR
How soon we need the design ? we will make EDR soon

γγ/eγ Collider

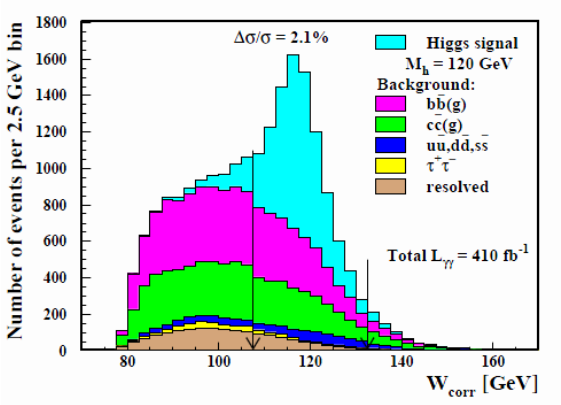




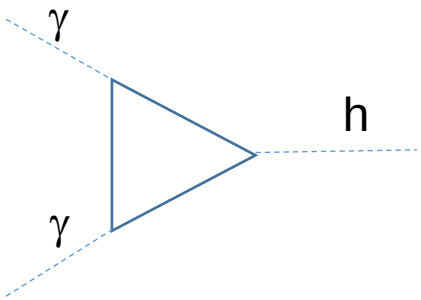
- γ spectrum is controllable laser and electron polarization
- polarized photon beam
- Eγ(max) ~0.8Ee typically

Physics (selected examples)

- S channel Higgs production
  - $\gamma\gamma \rightarrow h \rightarrow b\bar{b}$
    - $\delta(Br(h\text{-}b\bar{b})\Gamma(h\rightarrow\gamma\gamma))=2\%$



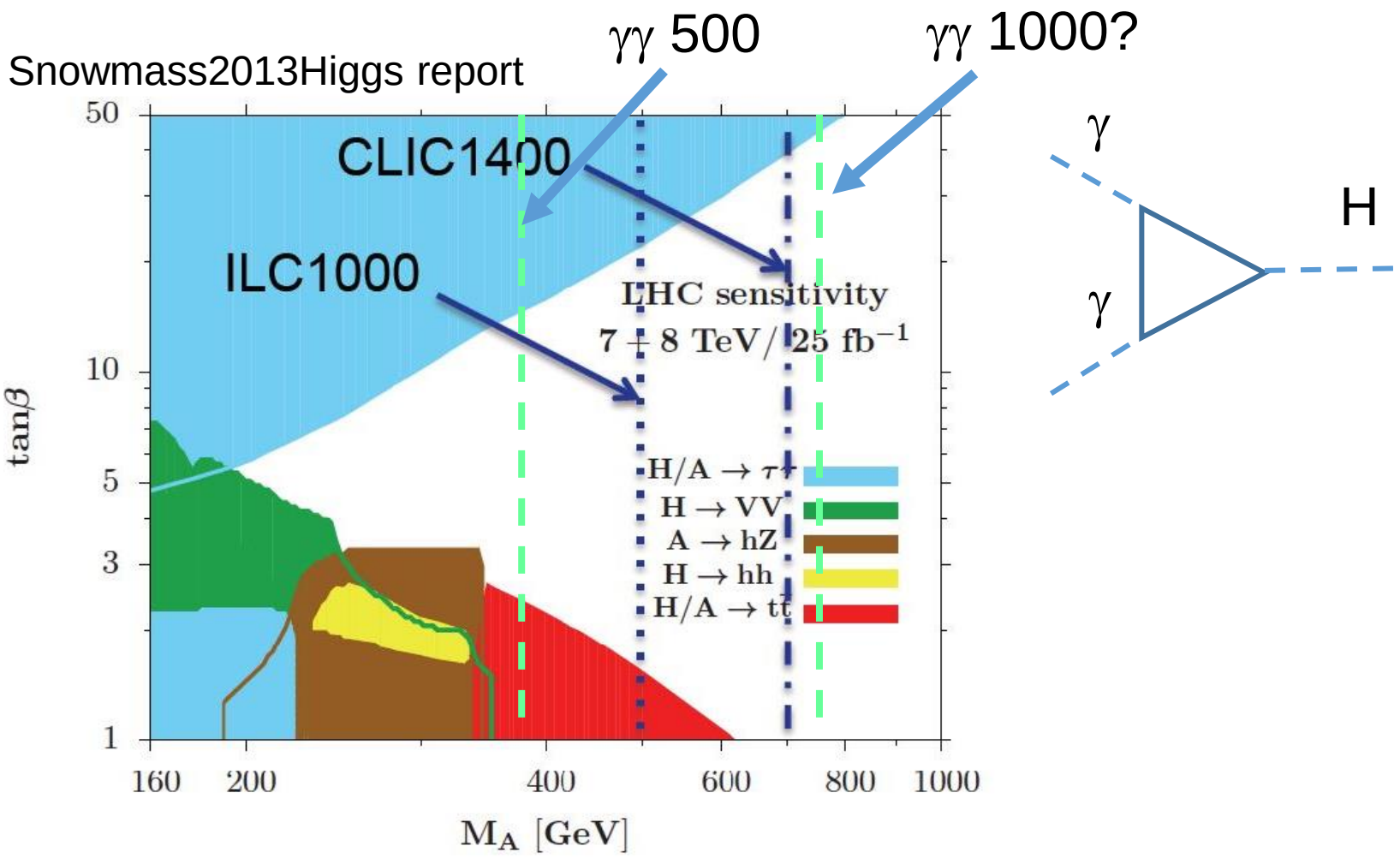
  - $\gamma\gamma \rightarrow h \rightarrow \gamma\gamma$
    - $\delta(Br(h\rightarrow \gamma\gamma)\Gamma(h\rightarrow\gamma\gamma))=12\%$



  - Heavy Higgs Bosons

Heavy Higgs Bosons

Snowmass2013Higgs report



How do we procceed?

- See if we have sufficient motivation to justify the modification
  - Gamma Colliders?
    - SM Higgs may not be sufficient
  - Two beam accelerator
    - ILC-CLIC relation

- Ccompatibility with e+e-
  - physics 
  - MDI
  - CFS

in a half ~ one year

Gamma Collider Beam dump