IR Design - Input from Lumi Group

Discussion/Comments on Request

Stephen JD Kay, Nicholas Zachariou, University of York

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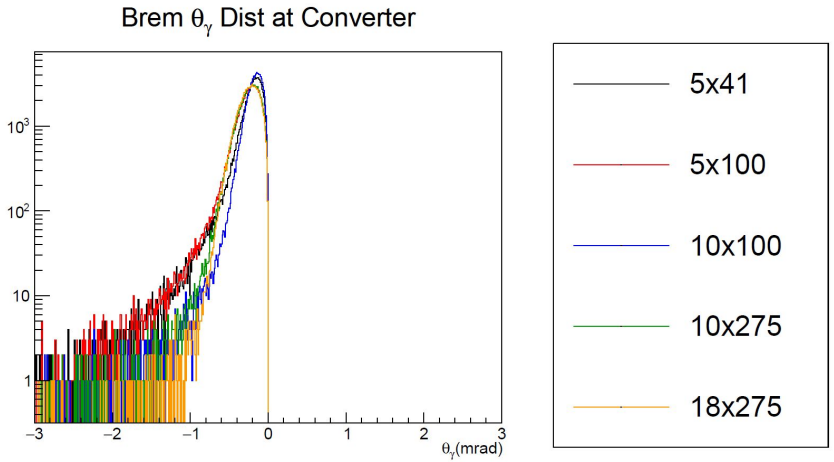
- Elke requested input from Luminosity group for some changes to the IR and the Lumi-Window
- The requested input is outlined on the next few slides, with comments/discussion points

IR Design - Input From Lumi Group - Request 1

- *“All the requirements the lumi-window needs to fulfill, an example material thickness, and material uniformity…”*
  - Requirements are largely in terms of precision to which we know these things
  - At Zeus, photon conversion in exit window contributed ~0.7% to overall systematic uncertainty (of ~1.8%)
    - 0.1% uncertainty from thickness
    - 0.3% from chemical composition
    - 0.6% from cross section
  - Many of these are mitigated/improved upon by
    - Sweeper magnet
    - 5σ obstruction free aperture
  - **But would expect comparable uncertainties from ePIC exit window**

IR Design - Input From Lumi Group - Request 2

- *"We need for all energies 5, 10 and 18 GeV the distribution from the bethe-heitler photons with all bem effects included and we need this as a output from the MC generator, so we have all the info"*
  - This is straightforward, have run previously
  - Will process large #events in range 0.1-Max GeV through generator/AB ASAP - produce updated versions of plots like those shown previously
    - Will provide as HEPMC
    - ROOT also possible
  - Will re-run
    - 5x41
    - 10x100
    - 10x130
    - 10x275
    - 18x275



IR Design - Input From Lumi Group - Request 3

- *“What you use as the most recent design of the lumi-window”*
  - Can provide latest geometry file from simulation (DD4HEP) used in lumi simulations
  - **Would note that for MC studies of the pair spec, the window doesn’t really factor in currently**
    - Generated photons from distribution are propagated to conversion foil and converted
    - Saves simulation time (only want to look at detection of pairs)
  - Can run directly with bremsstrahlung photon distribution as a test

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- *“@Jarda a link to your generator and a description how to run it with the correct settings for the beam effects.”*
  - Jarda can send on

Thanks!
Any questions?

Near Hellvelyn Summit - Cumbria, United Kingdom - 54°31'32.2"N 3°00'51.8"W