Photon Conversion Method for ALICE 3.
χ_{C} reconstruction.

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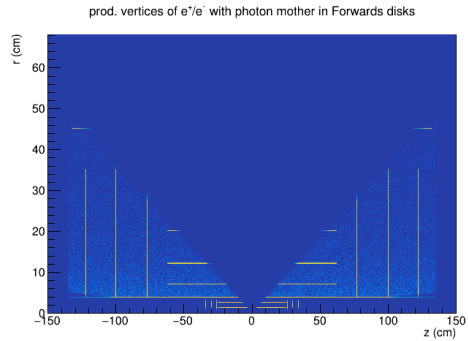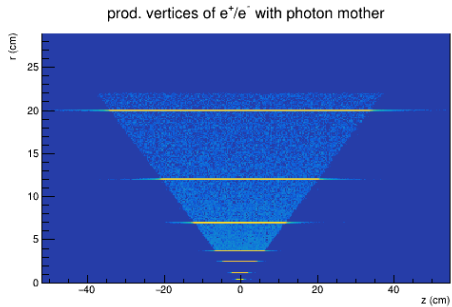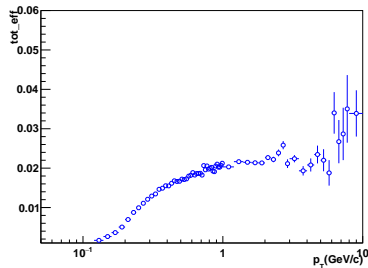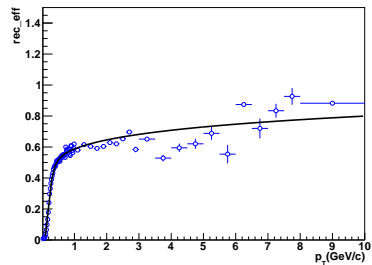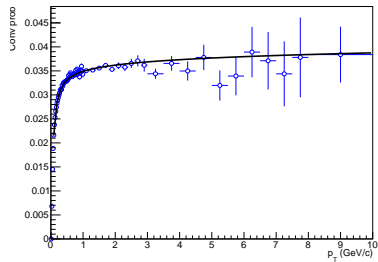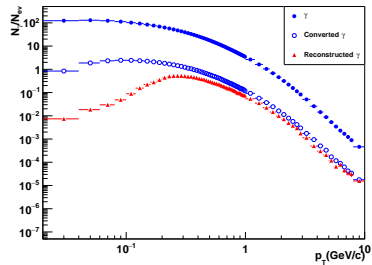February 17, 2022

Simulation and reconstruction settings

▶ Full simulations of pp $\sqrt{s} = 14$ TeV using PYTHIA 8.2 in local HD cluster (2.2×10^6 events generated)

▶ Analysis using MC information:
Central: $|\eta| < 1.3$ ($p_\mathsf{T} > 0.1$ GeV/c)
Forward: $1.75 < |\eta| < 4$ (p > 0.1 GeV/c)

▶ Conversion vertices: (5 layers for reconstruction)
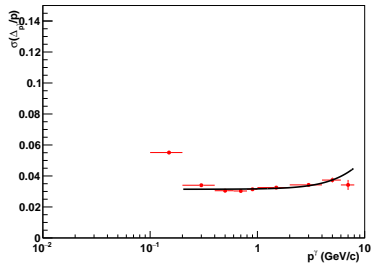Central: maxR $= 22$ cm
Forward: $-135 < Z < 135$ cm
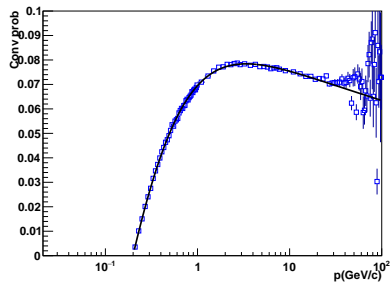
Photon Conversion vertices

prod. vertices of e⁺/e⁻ with photon mother

prod. vertices of e⁺/e⁻ with photon mother in Forwards disks

Central Barrel: γ reconstruction
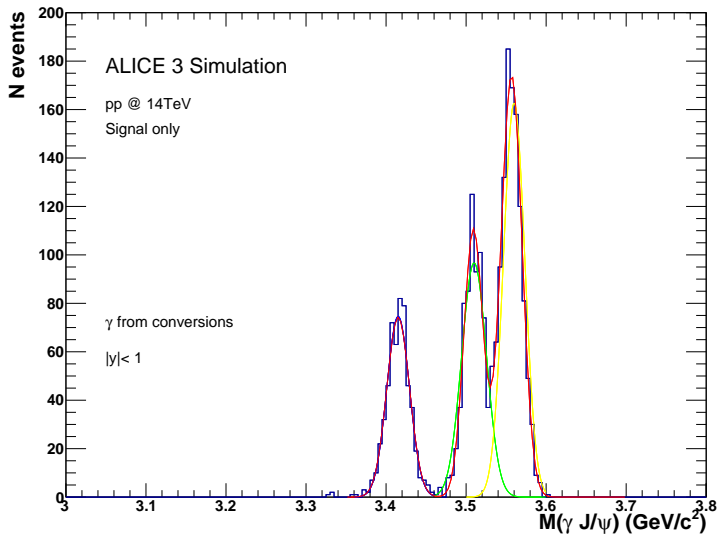
Central Barrel: γ resolution

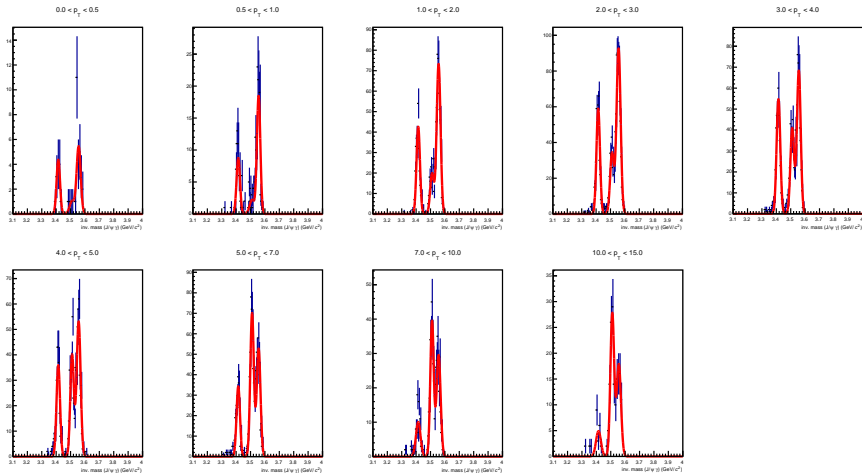# Forward Barrel: γ reconstruction
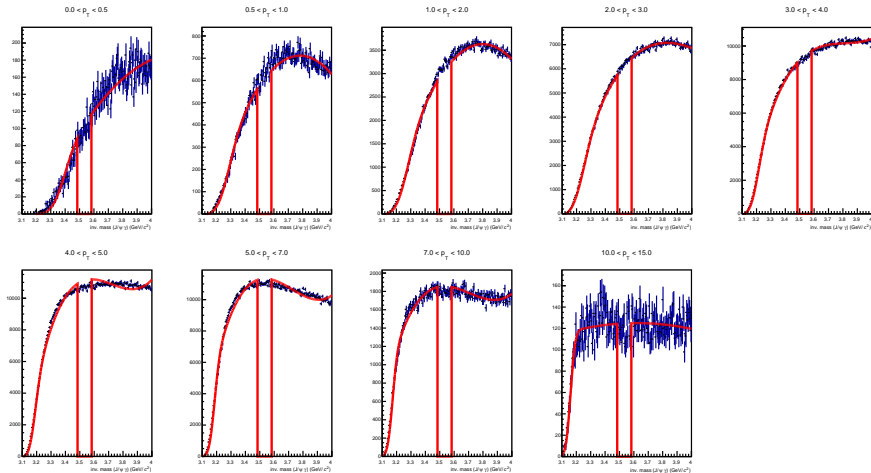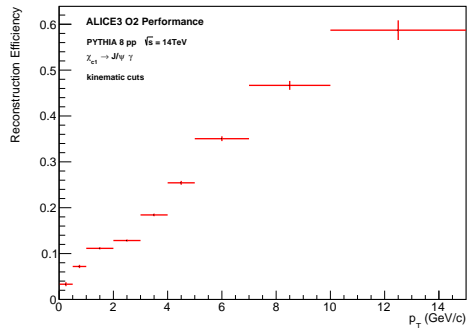
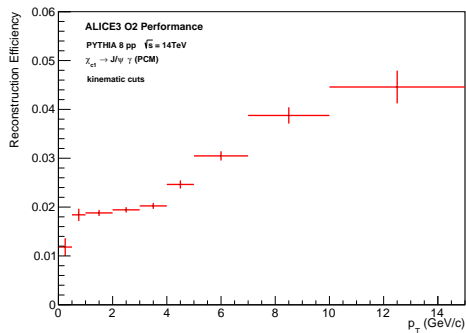# Central Barrel: $\chi_C \rightarrow J/\psi + \gamma$
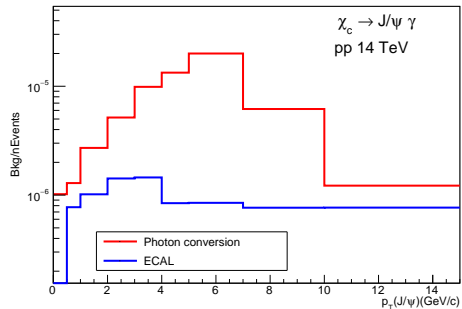
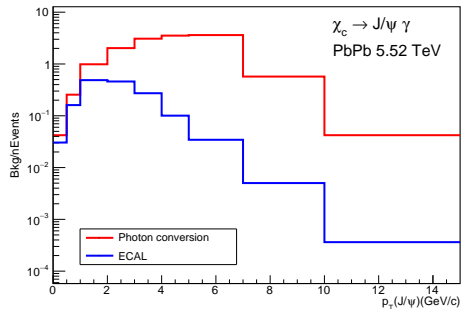Delphes Simulation

PCM: Signal estimation
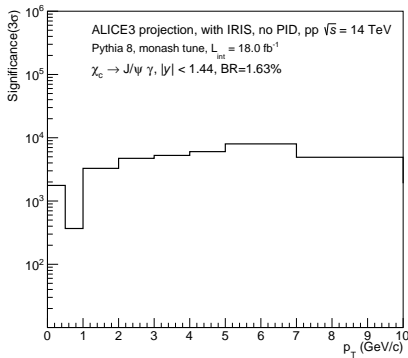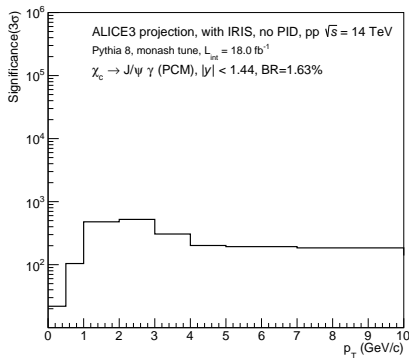
PCM: Background estimation

Reconstruction efficiency: PCM and ECAL
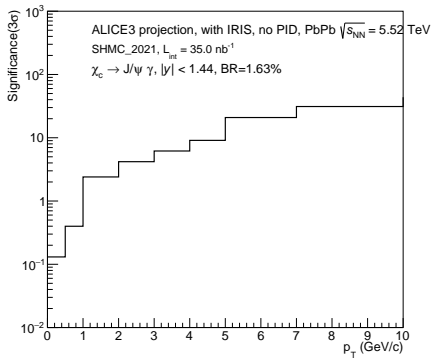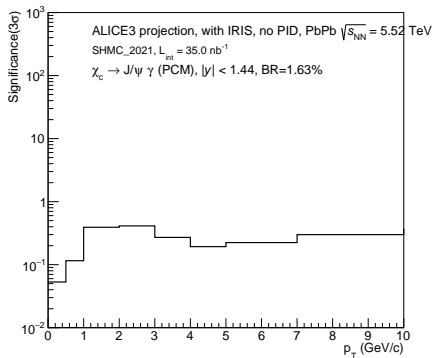
Background per event: PCM and ECAL

Significance in pp: PCM and ECAL

Significance calculated as sum of χ_{C1} and χ_{C2}

Combination of ECAL and PCM measurements will improve the significance

Significance in PbPb: PCM and ECAL

Significance calculated as sum of χ_{C1} and χ_{C2}