Tracking performance from realistic seeding in J/ψ photo-(electro-) production

EPIC tracking WG meeting

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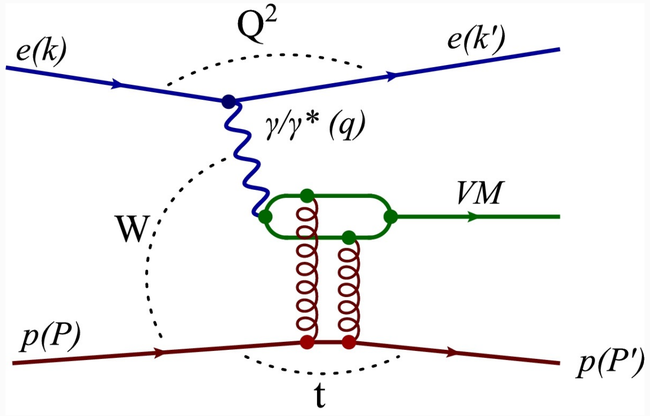
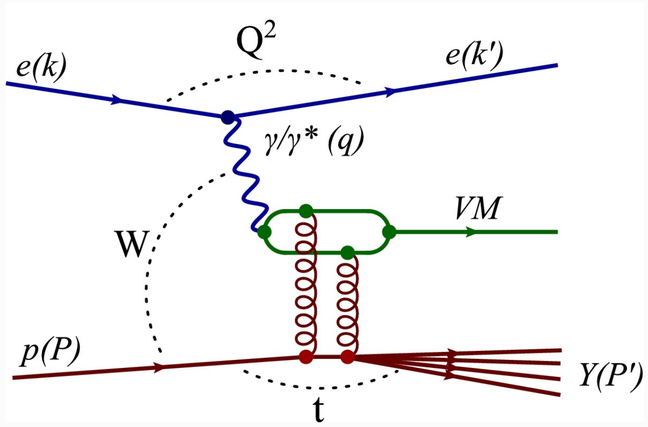
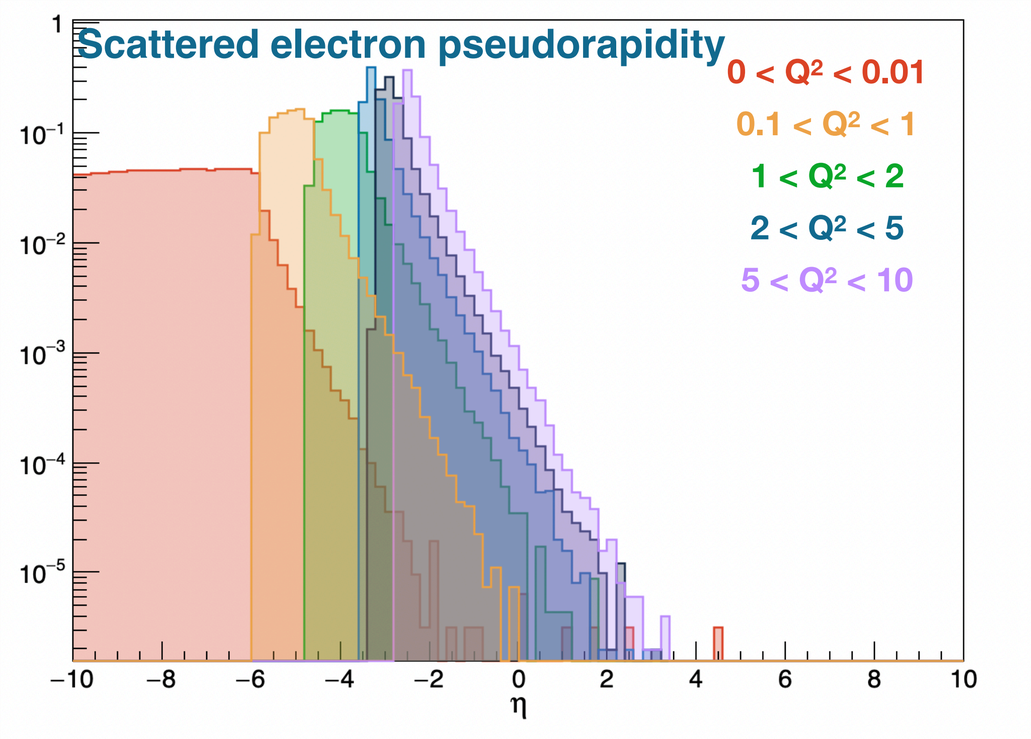
J/ψ photo-(electro-) production

- Coherent production of eA→eA'J/ψ→e(e+e-)A' with eSTARLight
- Electron beam energy of 18 GeV: ELECTRON_BEAM_GAMMA = 35295
- Au ion (197, 79) 100 GeV/nucleon: TARGET_BEAM_GAMMA = 106.6
- Standard detector simulation under EPIC software framework: npsim + eic_recon
- EPIC geometry: epic_craterlake including barrel and endcap mpgd layers
- 0.5 M events per each Q^2 range



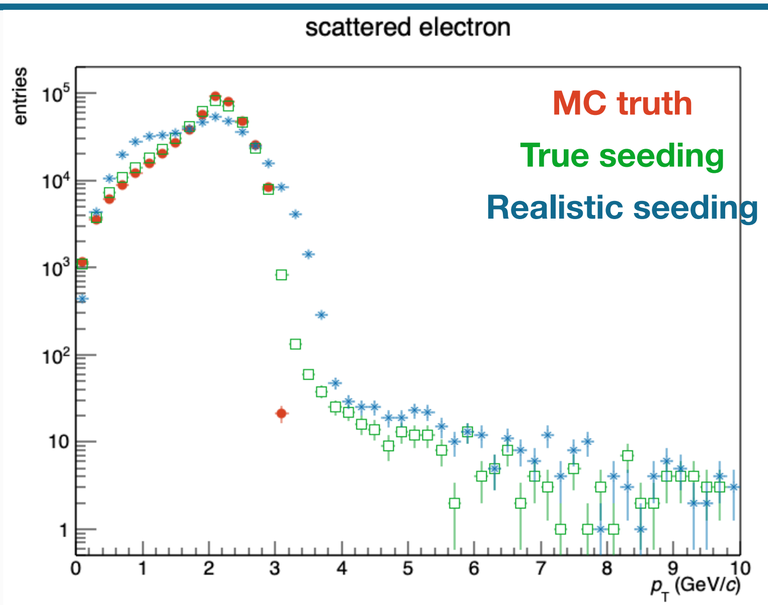


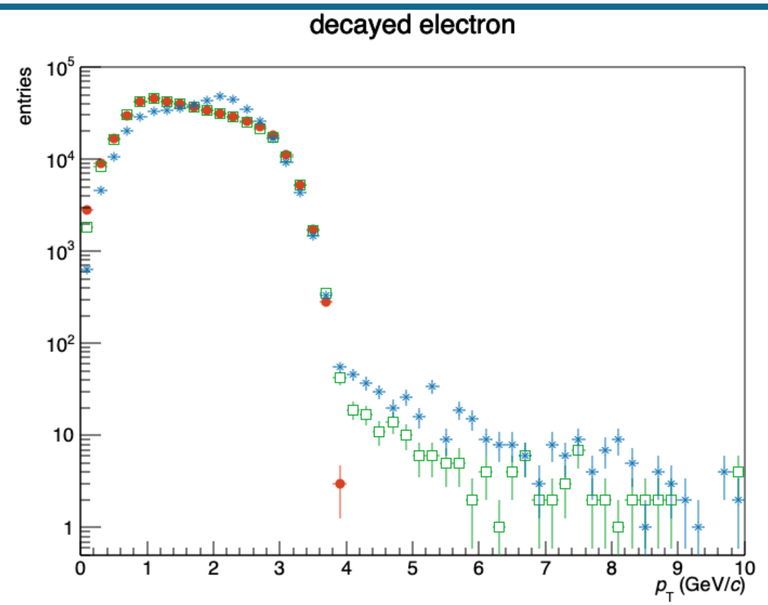


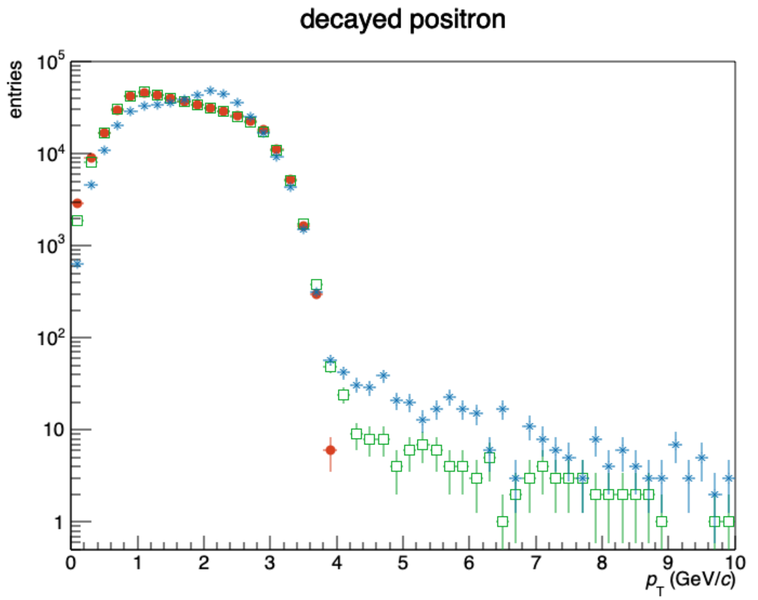
Kinematic acceptance of final state particles

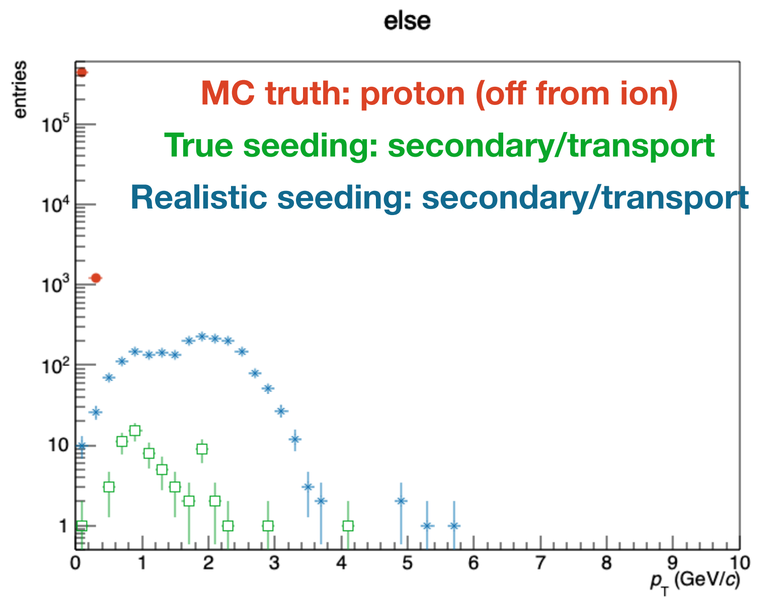
$5 < Q^2 < 10\ (GeV)^2$

- Both scattered electron and decay products are mostly in EPIC acceptance!
- Reconstructed pT from realistic seeding not too far from the one from true seeding (and MC truth)
- Secondary fraction is different in true/realistic seeding





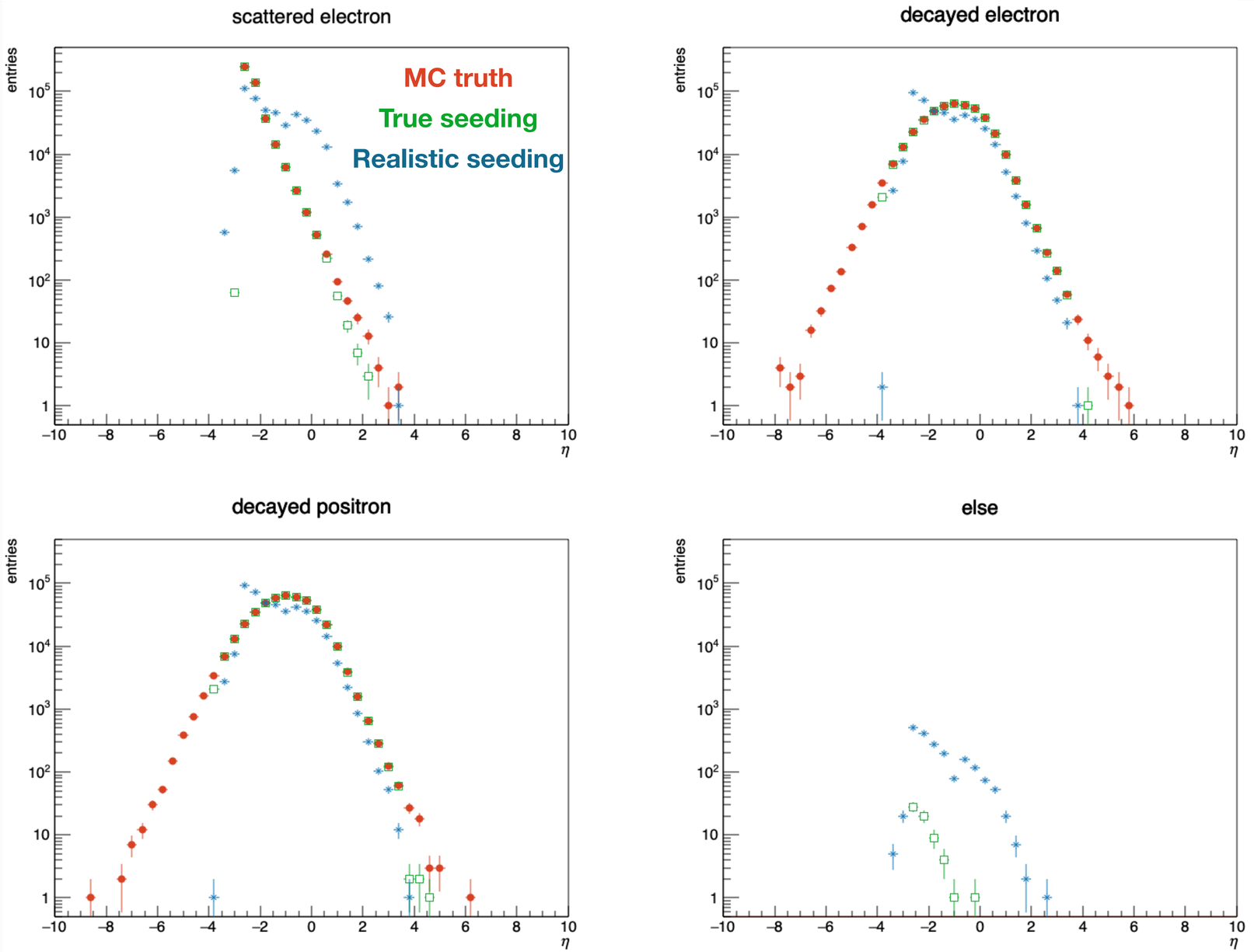




Kinematic acceptance of final state particles

$5 < Q^2 < 10\ (GeV)^2$

- Scattered electron and decay electron: different trend in eta
- Described in true seeding but not in realistic seeding -> issue in matching?
- Proton off from ion is not visible in EPIC acceptance

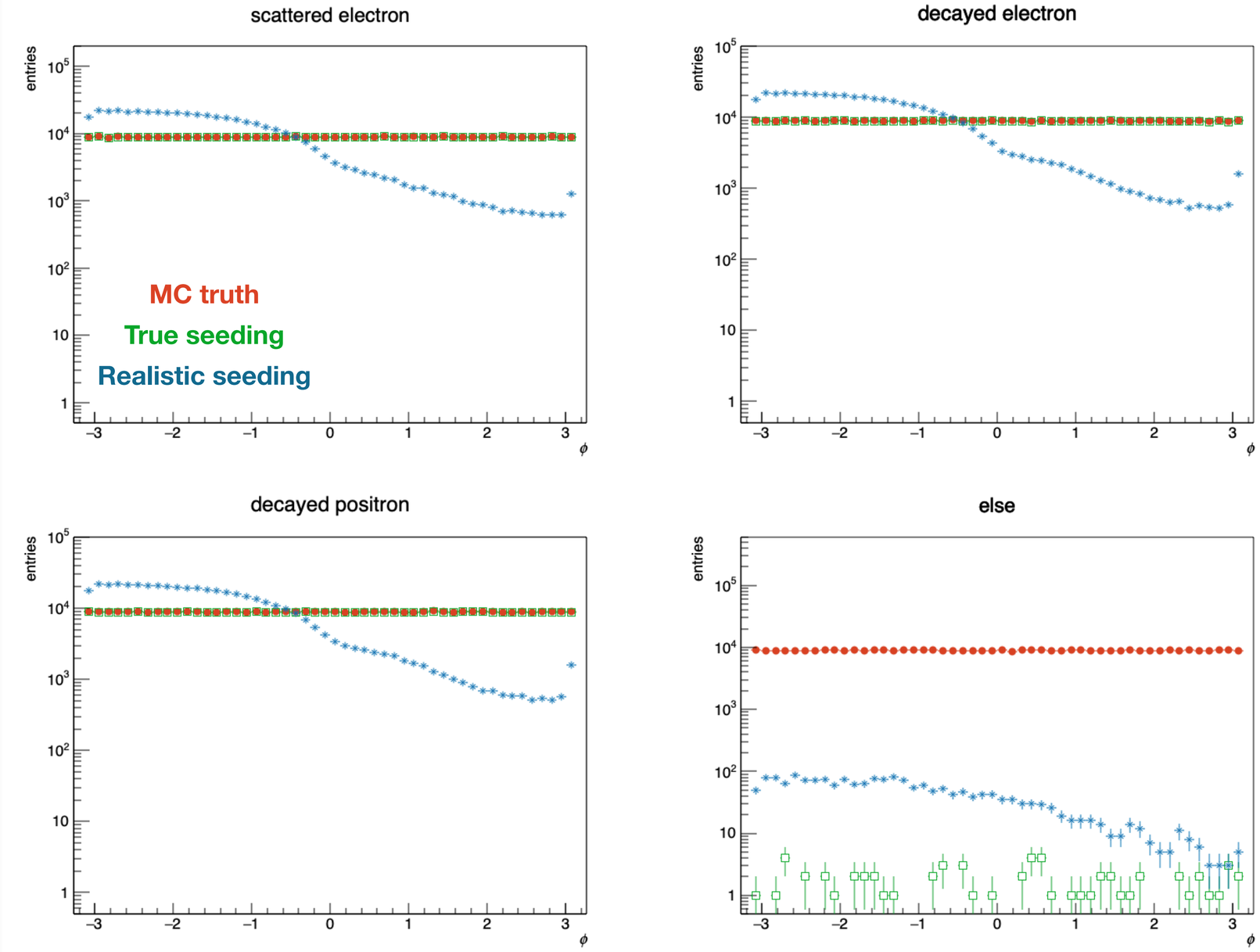


Kinematic acceptance of final state particles

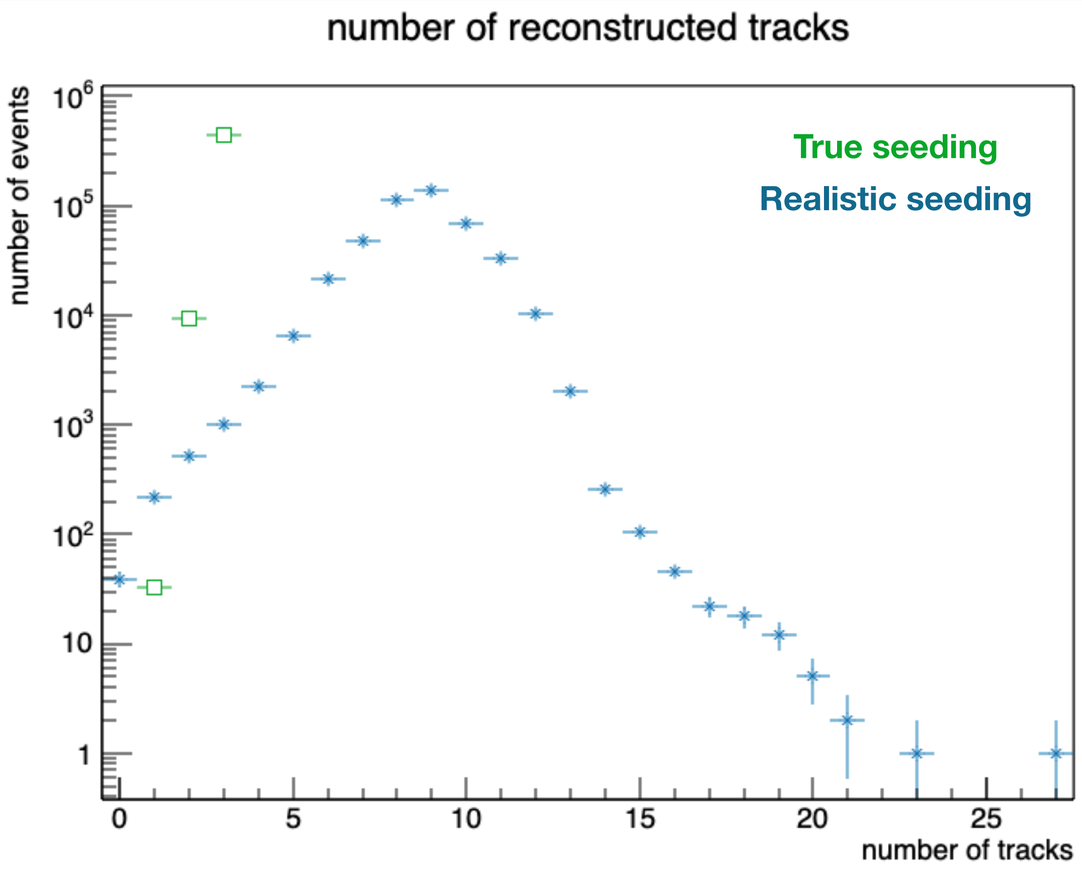
$5 < Q^2 < 10\ (GeV)^2$

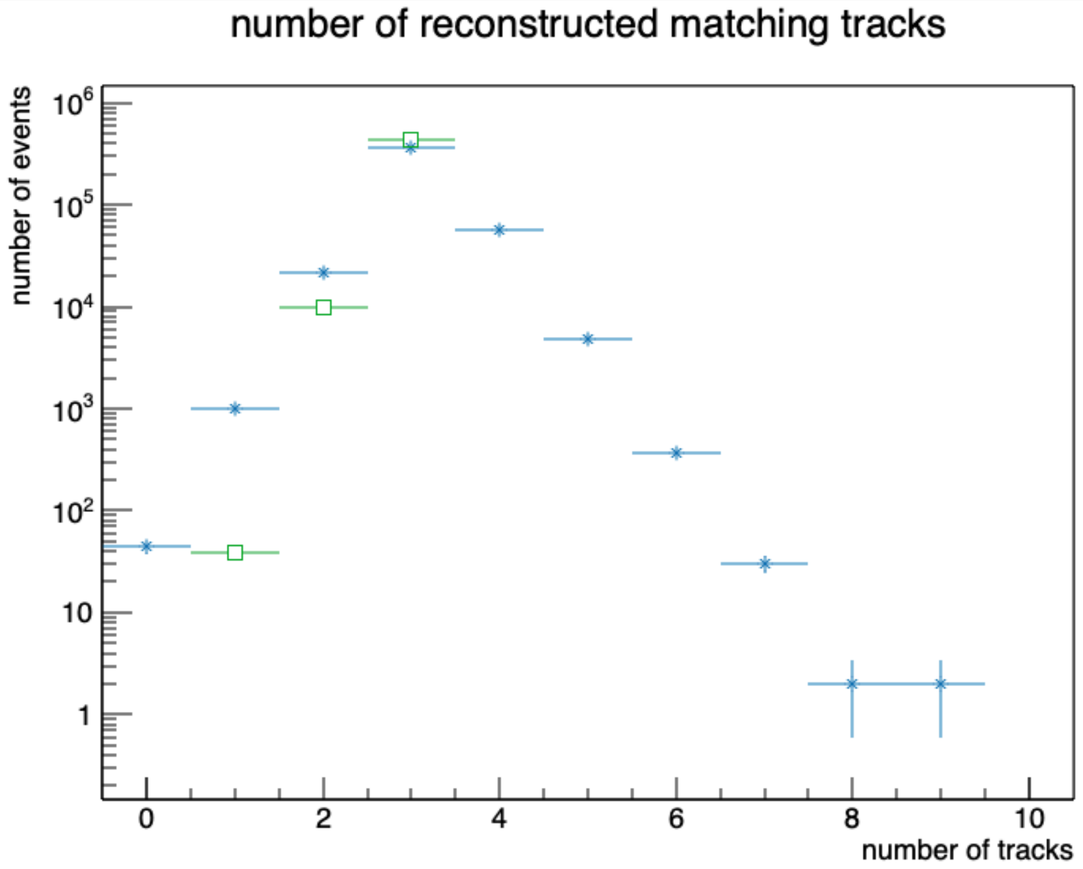
- Strange structure in phi distribution from realistic seeding
  -> issue in matching? Or in reco. algorithm in general?

- Comparison between true/realistic seeding



True seeding vs. Realistic seeding: multiplicity





- known issue: duplicated tracks realistic seeding; resulting large track multiplicity
- Next step: Track reduction in realistic sending and matching between particle and track