First Look at Two-Particle Correlations with Tracking

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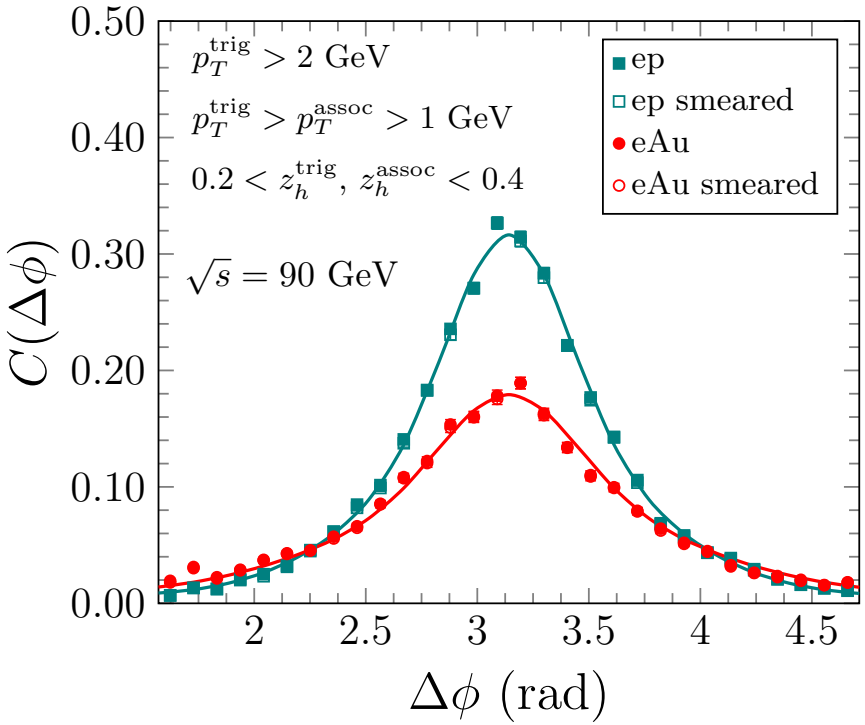
June 29, 2021

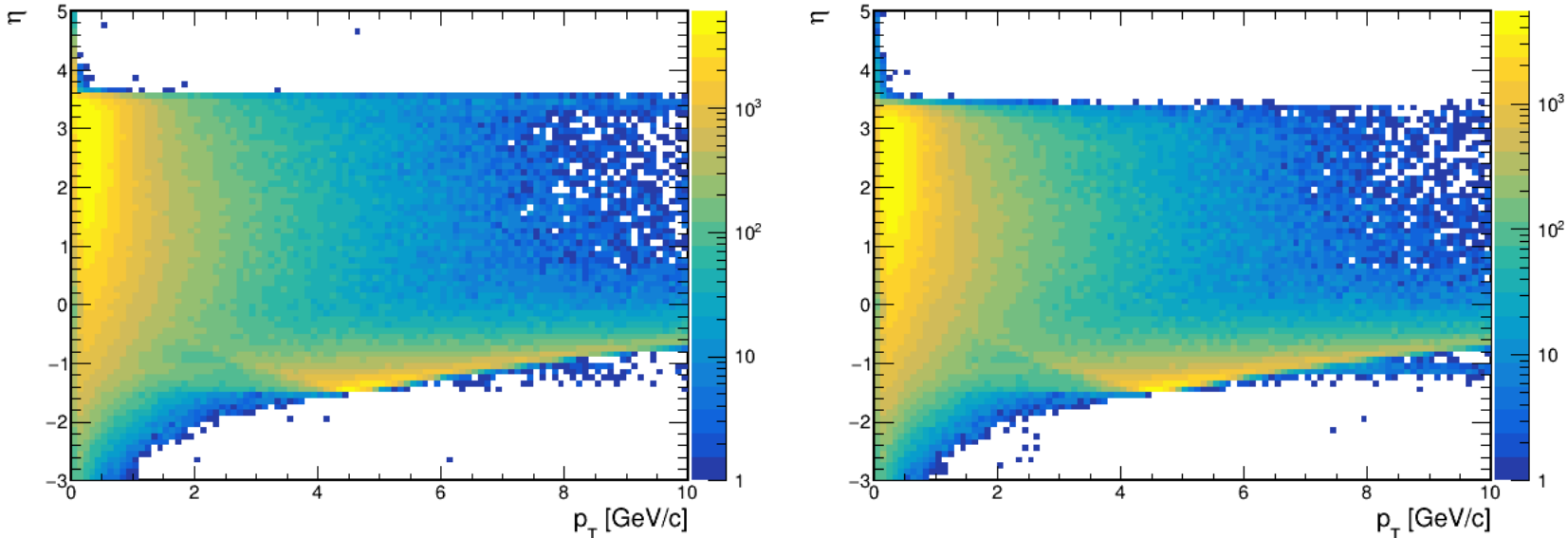
Goal: YR Fig. 7.63

- Figure 7.63 from the Yellow Report: two-particle correlations in e+A vs. e+p to study saturation.
- Can study cleanly measuring e.g. away-side yield vs. x for different Q^2 cuts.

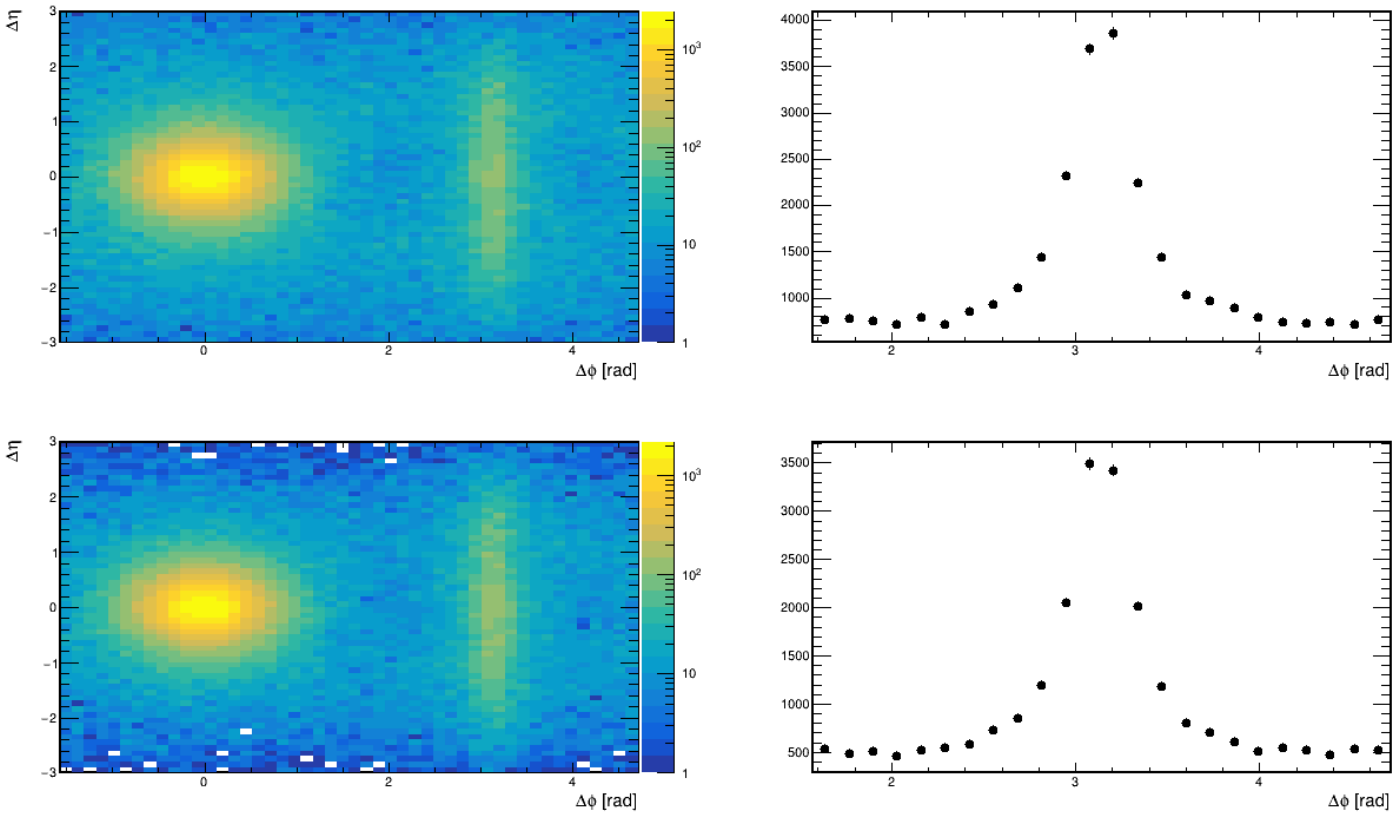


Simulation

- Used 250k events generated by Raymond on June 10.
- Pythia6 setup
  - 10 GeV electrons + 250 GeV protons
  - $Q^2 > 10$ GeV^2
- Detector setup
  - ALLSILICON-ETTL-CTTL-INNERTRACKING-ASYM-FTTLS3LC
  - I'm still learning what this means exactly.
  - Left: inner tracking, Right: Outer tracking

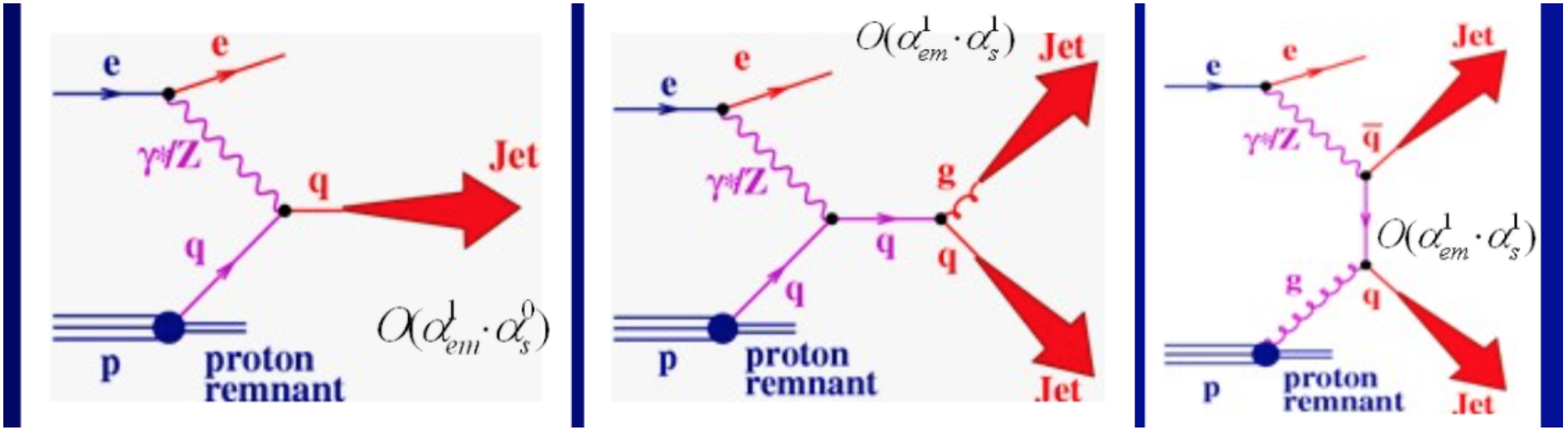


Two-Track Azimuthal Correlations



- All pairs with $p_T > 1$ GeV and $\eta > 0$.
- Top: inner tracking, Bottom: Outer tracking

Enhancing Dijets from Gluons



- $q\bar{q}$ dijets probes gluon content.
- Can we enhance the sample by doing opposite charge track correlations?
- Fully reconstructing jets – do we have sufficient jet multiplicity to do jet charge?

For the Proposal

- Need a comparable sample of e+A including nPDF modification/saturation.
- I agree with Rosi that $e + p$ and $e + A$ samples should use the same generator to minimize differences across generators.
- Pythia8 can do both and has at least nPDF modifications, which simulates the away-side yield suppression.