

Inclusive Group Report

**ATHENA Bi-weekly meeting
19 August 2021**

**Paul Newman (Birmingham)
Qinghua Xu (Shandong)
Barak Schmookler (Stonybrook)**

Status of Full Simulation Studies

- **Availability of Monte-Carlo Samples**

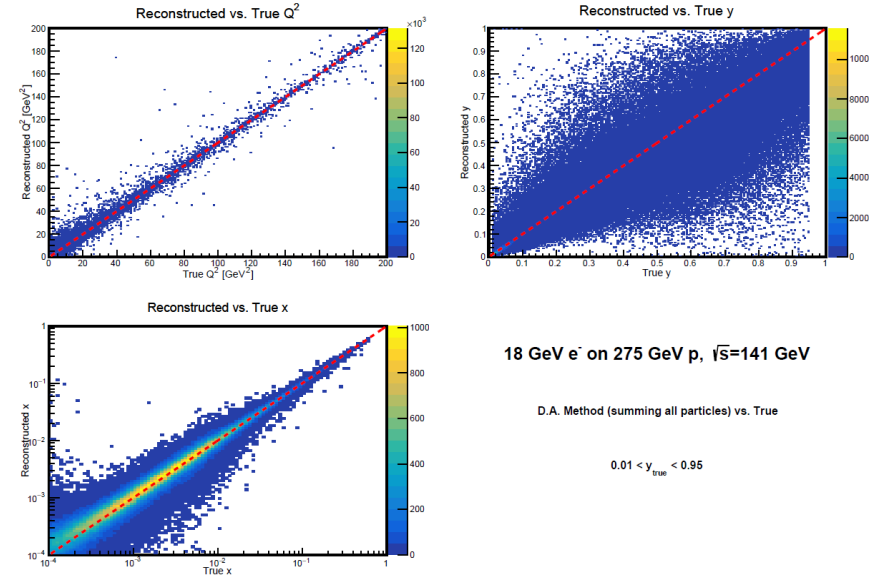
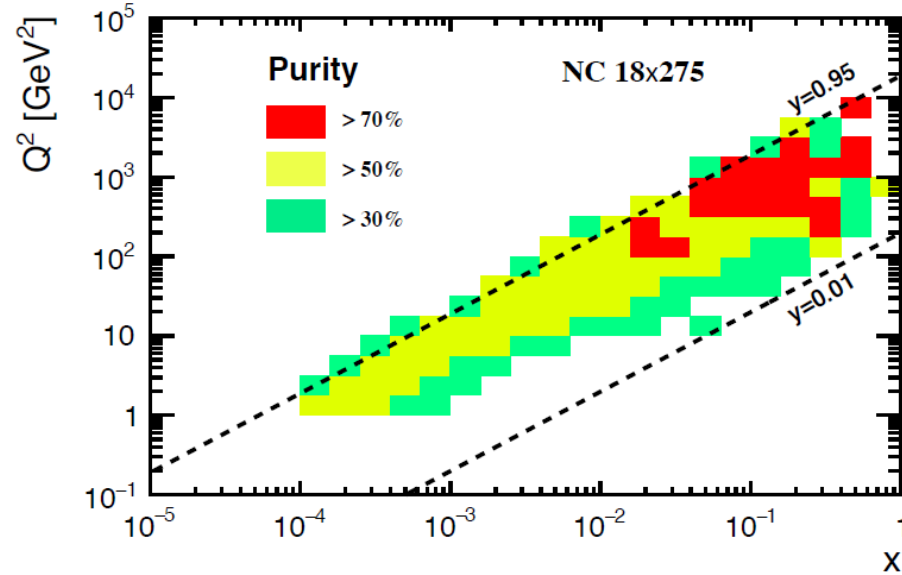
- *Full simulation studies using PYTHIA8 samples are being conducted. Issues observed with PYTHIA8 at low x , Q^2 still under investigation.*
- *Lots of inclusive DJANGO and PYTHIA6 MC generator files already exist.*
- *DJANGO probably most reliable MC (QED-radiation). New version (4.6.17) has just been released.*
- *Need files that go down to photo-production (not necessary to have ultimate description of cross sections) for e/π separation and conversion background studies. PYTHIA6 samples exist for this.*

- **Request for software group**

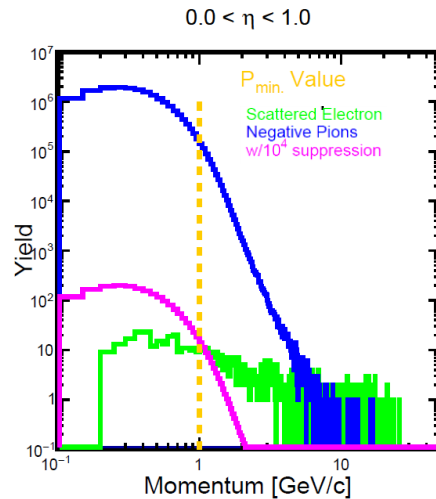
- *Our group now has several people working with the simulation output.*
- *The online/video tutorials provided by the software group have been very helpful!*
- *We have some specific questions related to, for example, track-calorimeter cluster matching - which is necessary to create a reasonable energy flow algorithm. We would like someone from the software group to attend our group meeting this Monday (or the following week) to discuss these questions.*

Possible 'Golden' Plots - Observable Level

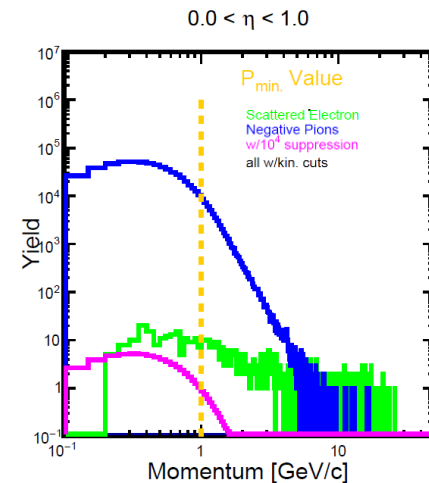
- Kinematic resolution



- Electron identification



Applying kinematic cuts



Possible 'Golden' Plots - PDF Level

- Derived from fits to NC and CC cross sections

- Inclusive proton PDFs
- Inclusive nuclear PDFs
- Proton spin PDFs

- Statements on sensitivity to e.g. new low- x dynamics follow from precision on these quantities

- Rekindling interactions with theory / fitting colleagues from Yellow Report

