

Exclusive & Tagging WG Update

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ATHENA bi-weekly meeting
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Golden channels - status

- All have had the listed event samples generated and passed to the software group (unless otherwise stated).
- All have been generated with head-on collisions – no crossing-angles implemented!
- Expected figures for proposal: hard to determine what will make the most compelling case *a priori*. We are aware of space limitations – this info will be available shortly after we have the simulated data!

Golden channel summaries

* **DVCS in ep** – EplC generator – Salvatore Fazio (INFN Calabria)

18 x 275, 5 x 100, 5 x 41 GeV²

10M events at each setting

Using Goloskokov-Kroll model

Kinematic acceptance cuts:

$$10^{-4} < x < 0.6$$

$$1 < Q^2 < 100 \text{ GeV}^2$$

$$0.01 < y < 0.95$$

$$0.01 < |t| < 1.6 \text{ GeV}^2$$

Golden channel summaries

* **TCS in ep** – EplC generator

– Daria Sokhan (Saclay / Glasgow), Kayleigh Gates (Glasgow)

18 x 275, 5 x 100, 5 x 41 GeV²

Positive and negative electron helicities

10M events at each setting

Kinematic acceptance cuts:

$$0 < Q^2 < 0.15 \text{ GeV}^2$$

$$0.01 < y < 0.95$$

$$0.01 < |t| < 1 \text{ GeV}^2$$

$$2 < Q'^2 < 10 \text{ GeV}^2$$

Golden channel summaries

* X,Y $\Psi(2S)$ in $ep \rightarrow J/\Psi \pi^+ \pi^- p$ – elSpectro

– Derek Glazier (Glasgow), Justin Stevens (W&M)

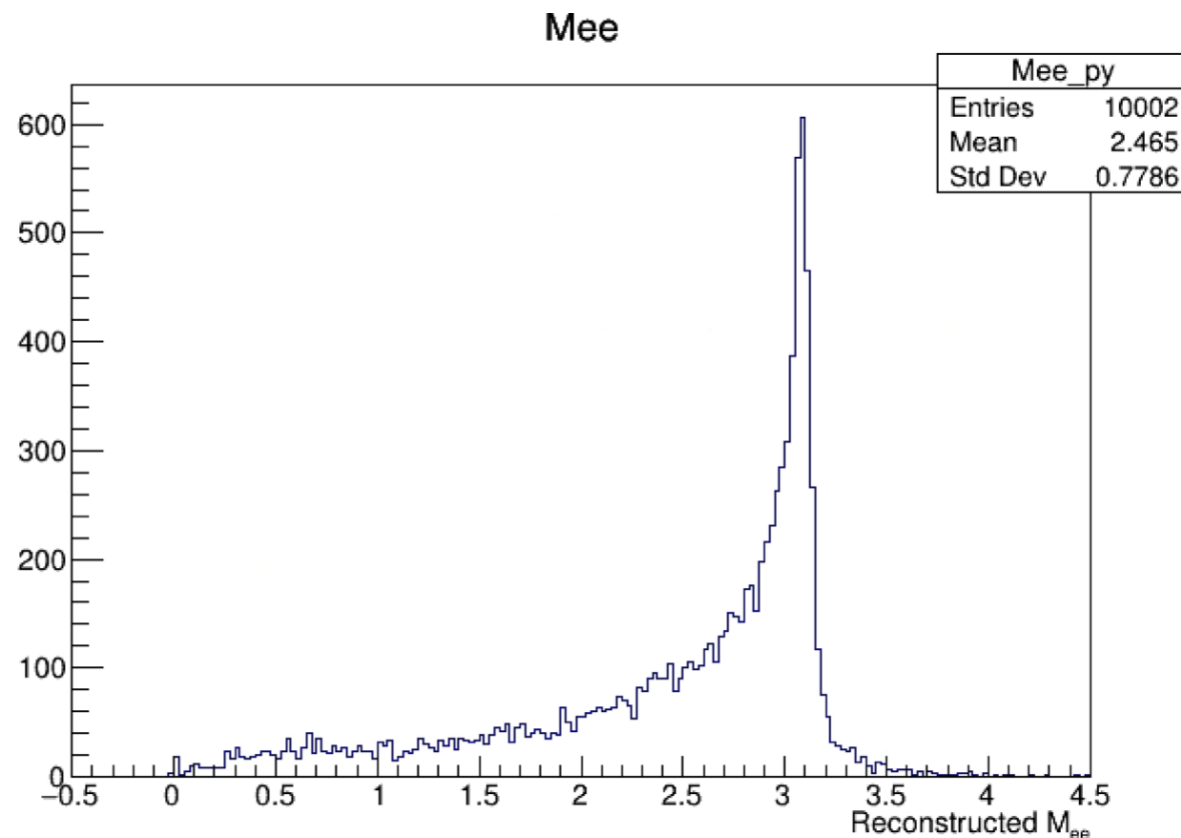
5 x 100 GeV², predominantly very low Q² (no cuts),

10k test-sample (processed),

300k submitted – awaiting output,

After analysis, will repeat for other beam energies.

Test sample: strong bremsstrahlung observed on the e^+e^- from the J/Ψ decay – this, however, used an old geometry and should be improved in the current frozen version.



Golden channel summaries

* Φ in eAu – SARTRE and BEAGLE – Kong Tu (BNL)

$1 < Q^2 < 20 \text{ GeV}^2$, $18 \times 110 \text{ GeV}^2$

10M events in SARTRE

100k events in BEAGLE

$Q^2 < 0.2 \text{ GeV}^2$, $18 \times 110 \text{ GeV}^2$ in BEAGLE

Full stat. samples available: 100M

* $Y(1S, 2S, 3S)$ in ep – eSTARlight – Spencer Klein (LBNL)

Photoproduction ($Q^2 < 1 \text{ GeV}^2$) and electroproduction ($Q^2 > 1 \text{ GeV}^2$)

$18 \times 275 \text{ GeV}^2$

Test-sample simulated so far: photoproduction, top energy, 5k events

Golden channel summaries

* Backward production of $\omega \rightarrow \pi^0 \gamma$ – eSTARlight

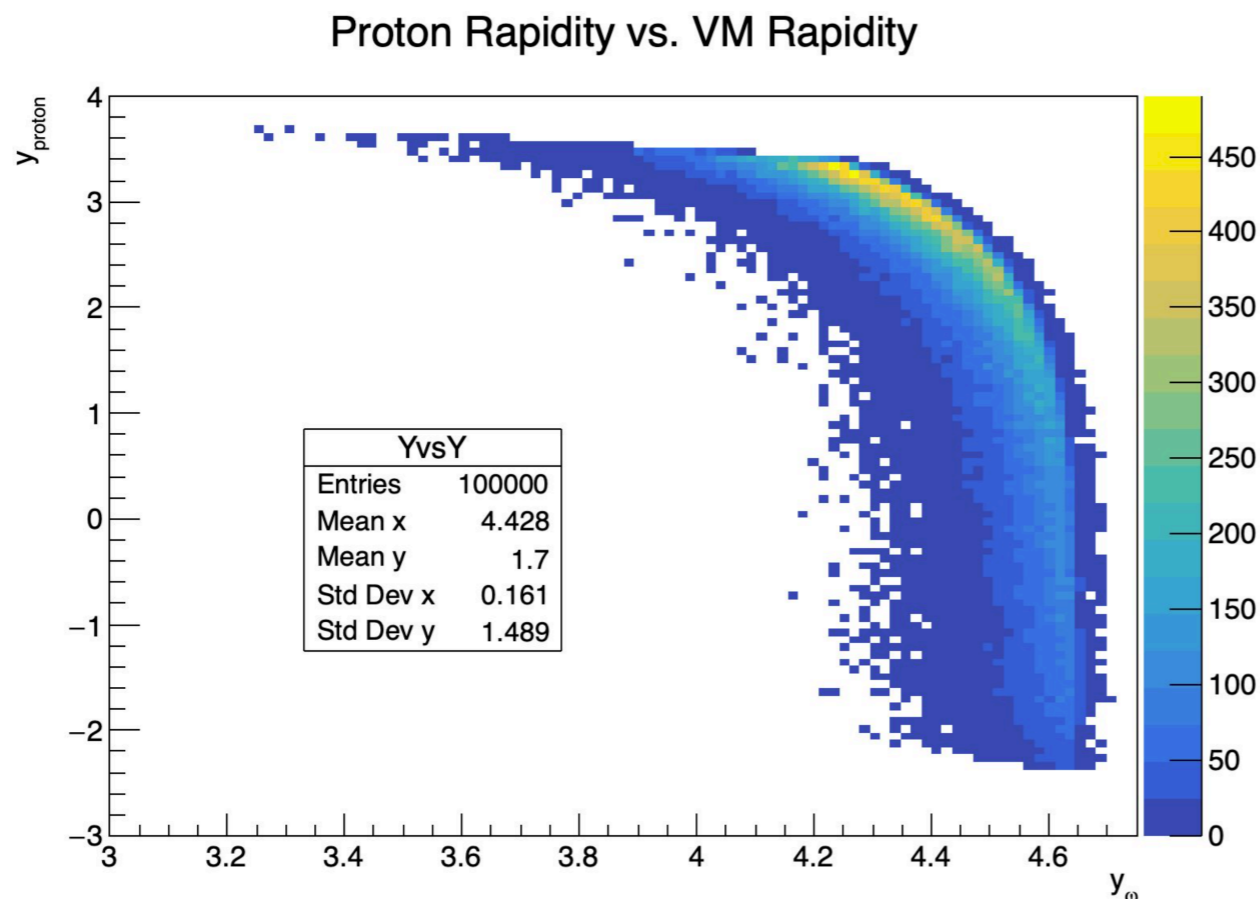
– Zach Sweger (UC Davis), Spencer Klein (LBNL), Samuel Heppelmann (UC Davis)

Photoproduction ($Q^2 < 1 \text{ GeV}^2$) and electroproduction ($1 < Q^2 < 5 \text{ GeV}^2$)

5 x 41 GeV²

5k test-sample sent for simulations – 100k samples available after test.

Generated events in photoproduction:



Ω is a challenge – relies on the B0 calorimeter.

Electroproduction should have more favourable rapidities.

Large cross-section, limited geometric acceptance is not critical.