e+A Diffraction "Plan"

Mark D. Baker*

8 Sep 2021

Key tools, questions & critical path items

* - mdbaker@ mdbpads.com,bnl.gov,jlab.org

Key plots to aim for

- "Foreground" plots – especially impact of beam effects.

- Reproduce background rejection for Pb @ IP6.
  - Need all forward detectors simulated <u>at some level</u>.

- Background rejection for Zr @ IP8
  - Need all forward detectors simulated <u>at some level</u>.
  - With Au or p 10σ for all RPs?
  - With the 10σ we need to get good A-1 tagging?

Sar*tre* for Pb (Peter)

- Reproduce/understand classic J/ψ & ϕ plots from Au for Pb w/ simple 5% t smearing.

  - Extra smooth or realistic plots?

- Impact of perfect detector, but beam effects?

  - Is the show already stopped?

  - Do we have e & Pb p-spread included?

 - Alternatives to dσ/dt?
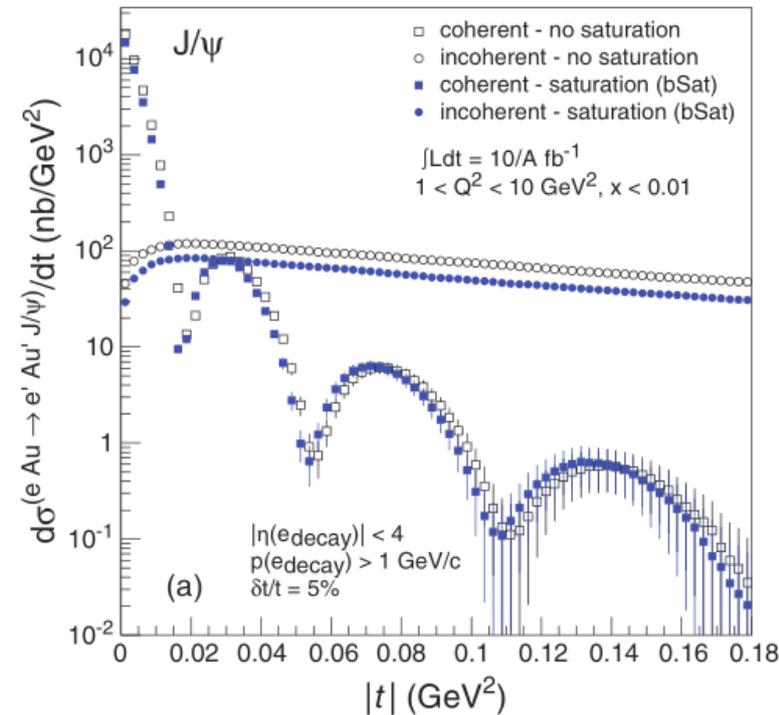
Toll, Ullrich,
 PRC 87, 024913 (2013)

Sar*tre* for Zr (Axel)

- Key question: coherent/incoherent vs. A.
  Is Zr harder or easier in terms of background rejection needs?

- This seems on the critical path.

Background Rejection IR6 w/ Pb (Dhevan)

- Prove that we have all of the tools working. Critical path. Uses full Pb J/ψ BeAGLE sample.

Chang et al.,
https://arxiv.org/abs/2108.01694
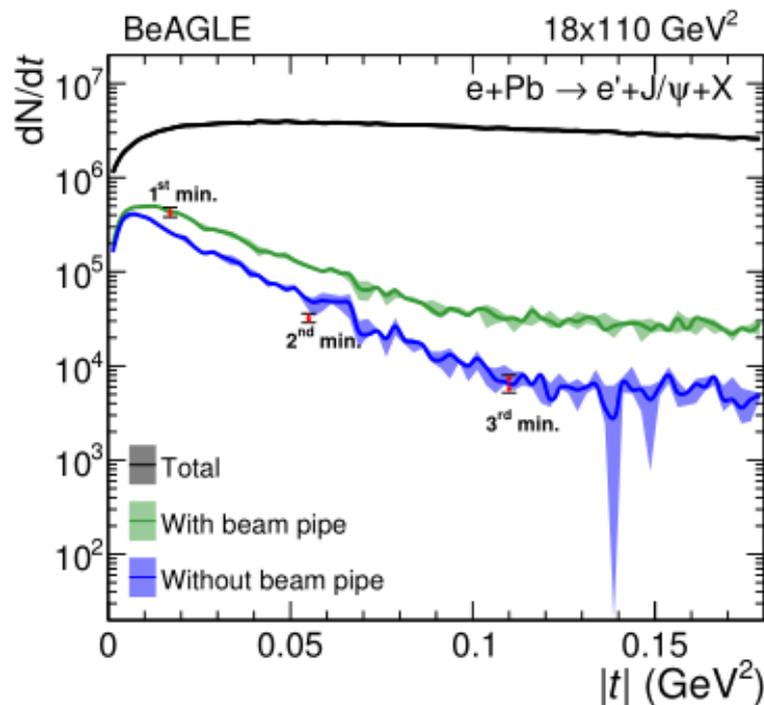
FIG. 7. Momentum transfer $|t|$ distribution in incoherent J/ψ production in ePb collisions at the EIC energy. Different lines indicate with or without beam pipe.

Back. Rejection IR8 w/ Pb & Zr (Dhevan)

- Uses full Pb & Zr J/ψ BeAGLE samples.

- Needs all forward detectors simulated at some level.

- Needs good understanding of 10σ for all RPs.

- Needs analysis code.

- Very tight for end of September. Are we on track?

Conclusions

- We have a lot to do and time is tight.

- Lots of big picture questions open:

  - Can we handle the beam effects?

  - Does IP8 help with Pb?

  - Is IP8 dramatically better for Zr due to A-1 tagging?

- What have I missed?