Regina Future Plans for Meson WG

University of Regina

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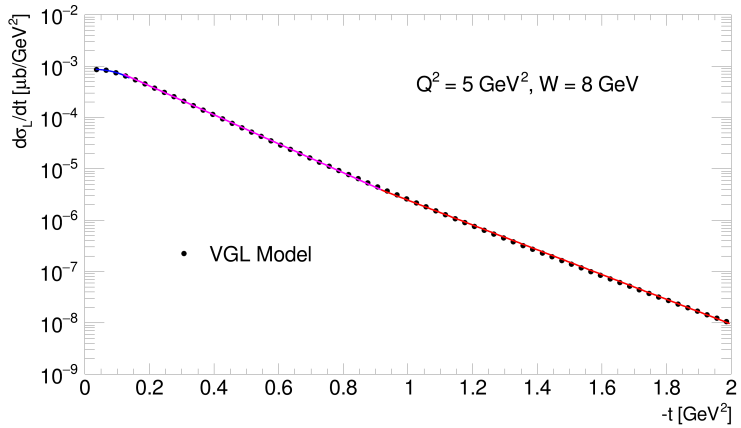
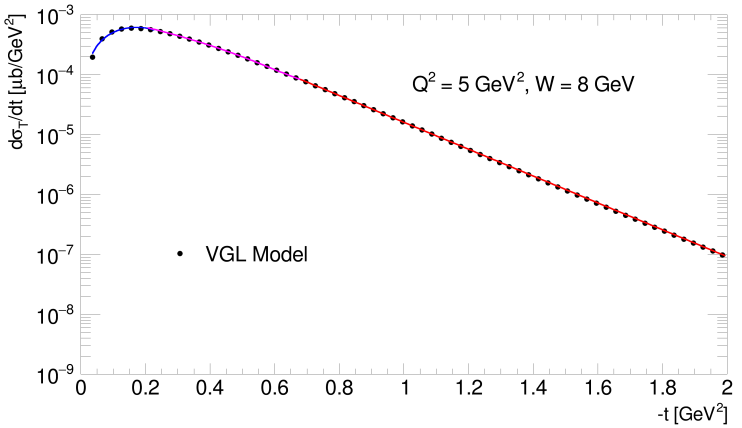
- **Love Preet (MSc student) has completed the p(e,e'$K^+\Lambda/\Sigma$) event generator needed to study feasibility of K^+ form factor mesurements at the EIC**
  - Based on parameterization of VGL K^+ model over wide range of kinematics appropriate for EIC studies:

    $1<Q^2<35$ GeV^2, $2<W<10$ GeV, $0<-t<2$ GeV^2





- **For more information, see recent presentation:**

  http://lichen.phys.uregina.ca/index_files/talks/LPreet_WNPPC_2023.pdf

  Love can give presentation on generator at a future Meson WG meeting

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- **Present status:** we can generate "truth" kinematic distributions for e', K^+, Λ/Σ in units of Hz at given Lumi

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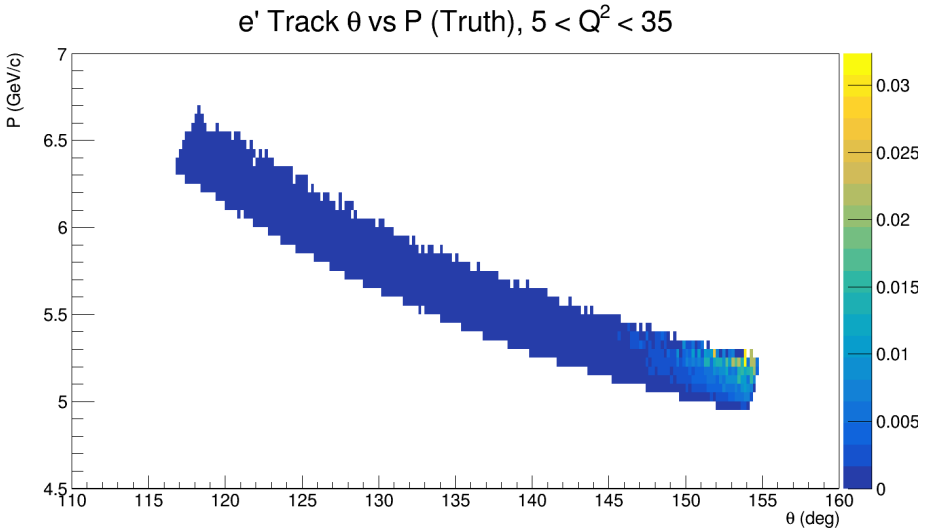

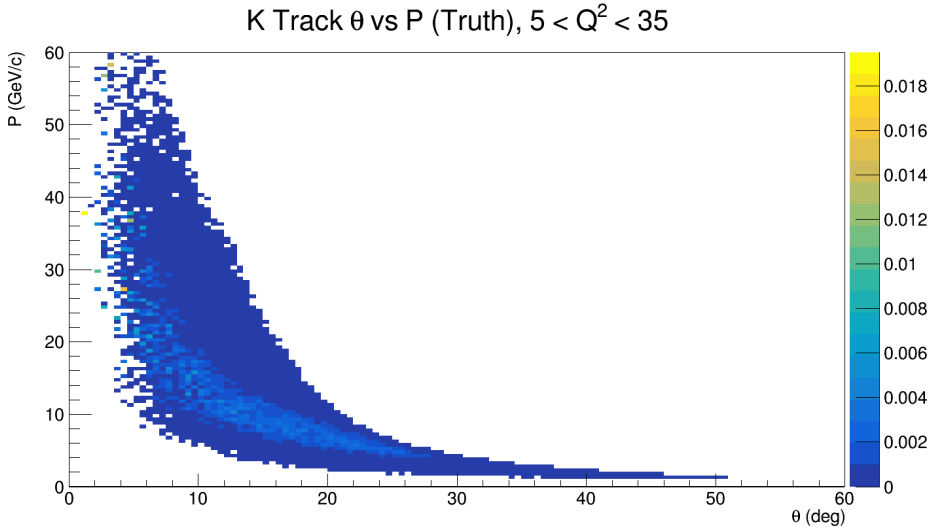

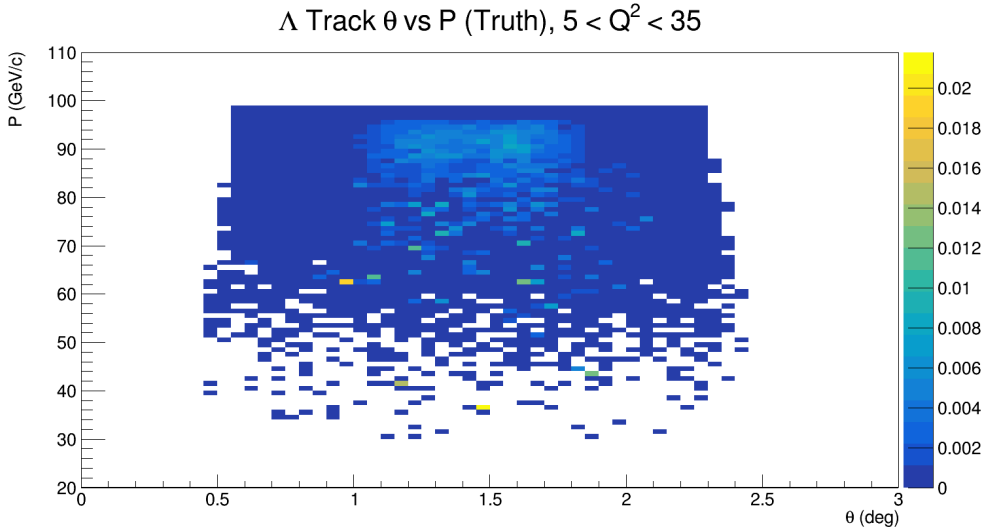

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- **Detailed acceptance and reconstruction resolution studies require event weights be retained in ePIC reconstruction**
  - Reconstruction is available for stable e' and K^+, but not full event reconstruction including Λ/Σ decay, which is needed to study whether $\Lambda \to p\pi^-$ and $\Sigma \to \Lambda\gamma \to p\pi^-\gamma$ detection are feasible/reliable with ePIC
    - Would clarify needed performance of B0 calorimeter, ZDC, etc.
  - Also, event weights are not retained in ePIC reconstruction right now. We have raised the issue and understand there are pressing matters of higher priority right now, and there will be a lengthy delay until this can be added.
  - We would very much like to include such reconstruction plots in a future Meson WG paper, just as we did for π^+ form factor with ECCE, but timeline is uncertain
  - This is Stephen's last week with us, before heading to UK

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