Open tasks and needed help with Exclusive & Tagging WG Update

Salvatore Fazio, Spencer Klein and Daria Sokhan
Conveners meeting with the Indian groups

❖ Exclusive and Tagging PWG meeting times: Fridays @ 12:30PM (ET)

  ▪ Indico: https://indico.bnl.gov/category/368/

  ▪ Mailing list: eic-ip6-phys-excl-l@lists.bnl.gov

○ **Four vector meson generators with partially overlapping final states**

  ▪ SARTRE, BEAGLE and eSTARlight, lager

  ▪ Do they agree with each other? Do they agree with HERA data?

  ▪ **Proposal:** pick a set of channels. Generate a set of events (in HepMC format), compare the cross-sections, & distributions of rapidity, Q^2, M, t and decay product angles

  ▪ We are looking for volunteers! (*Contact: Spencer Klein <srklein@lbl.gov>*)

  ▪ **Possible channels for comparison:**

    • ep-> epρ + direct $\pi^+\pi^-$ -> ep $\pi^+\pi^-$ at HERA energies

    • ep-> ep Y(1S) -> e Au ee at HERA energies

    • eAu-> eAu Y(1S) -> e Au ee 18 GeV e- on 110 GeV/n Au

    • eAu -> eXϕ -> eXK$^+$K$^-$ 18 GeV e- on 110 GeV/n Au

o **Validation of ATHENA detector for DVCS**
- Novel EpIC generator
- Processes: DVCS, Backgrounds: Bethe-Heithler, exclusive π^0
- Experimentally we look at two e.m. clusters and one track.
- **Task 1 – Validation of ATHENA with DVCS selection:**
    1. Generate PYTHIA min bias sample
    2. Pass through ATHENA reconstruction
    3. Analyse reconstructed pseudo-data with DVCS selection
    4. Negligible sample survives -> ATHENA ensures exclusivity for DVCS
- **Task 2 – Analysis of backgrounds**
    1. Use simulation of exclusive π^0
    2. Check that electron/pion ID in ATHENA is sufficient to reject it (identify DVCS photon)
    3. Check the ratio of DVCS/BH in final sample after selection
- Help very welcome! (*Contact: Salvatore Fazio <salvatore.fazio@unical.it>*)
- **Similar studies also needed for TCS** (*Contact: Daria Sokhan <daria.sokhan@glasgow.ac.uk>*)