Motivation

Hall C TCS (LOI12-15-007): brems. photon beam, transversely polarized UVA target, NPS.

Hall B DVCS (PR12-12-10): electron beam, transversely polarized HD-ice target, CLAS12.

Different phase space coverage, but similar physics.

Figure of Merit for asymmetry measurements with polarized target:

$$FOM = R_A \cdot D_f^2 \cdot P_t^2$$

R_A -- event rate in acceptance,
D_f -- dilution factor of target,
P_t -- target polarization.

Hall C TCS:

- **Photon flux -- $\mathbf{4 \cdot 10^{11}/s}$** (CUA HIPS workshop);
- Target – 3 cm length, 0.6 packing fraction, 0.817 g/cm^3 NH_3 density, 0.125 LHe density. → $\mathbf{0.4 \cdot 10^{36}\ cm^{-2}s^{-1}}$ **luminosity**.
- Combined with acceptance simulations → **2 Hz total rate**.
- **Dilution factor**: depends on kinematics, ranges from 0.05 to 0.2, 0.16 on average; **0.147** naïve estimate.
- **Target polarization: 90%** (CUA HIPS workshop).
- Combined all together: $\boldsymbol{FOM = 0.036\ Hz}$.

Hall B DVCS (based on PR12-12-10):

Event rate: 1M in 100 days → 0.12 Hz useful event rate; ~1/3 dilution factor → **0.36 Hz** total rate.

Dilution factor: ~1/3.

Target polarization: 60%.

Combined all together: $\boldsymbol{FOM = 0.014\ Hz}$.

Conclusion: HC TCS is competitive.