

The figure of merit for exclusives at EIC and JLab

Event rate: **luminosity** x **cross section** x **acceptance** (and efficiency)

Polarized figure of merit: **event rate** x **(e-polarization)²** x **(target polarization)²**

- Dilution for polarized fixed targets at JLab
 - In NH_3 only the hydrogen is polarized while the ^{14}N is not. This means that only 3/17 of the nucleons or 3/10 of the protons are polarized. This factor enters squared in the figure of merit.
 - In contrast, colliders like the EIC can use polarized proton beams with no dilution.
- Transversely polarized targets require a holding field that is perpendicular to the beam direction. This leads to significant luminosity restrictions.
 - The CLAS12 transversely polarized target (RGH) will be run at a luminosity *lower* than the EIC!
- After early running, the EIC will always run polarized protons, collecting equal amounts of longitudinal and transverse data. As a comparison, the current CLAS12 plan for protons is
 - Unpolarized (RGA+K). 239 days, Longitudinal (RGC) 120 days, Transverse (RGH) 110 days
- Any fixed target, polarized or not, gives rise to Moller electrons which cause background hits in the trackers and reduce the reconstruction efficiency (fewer events get recorded).
 - The reconstruction inefficiency gets worse at higher luminosity