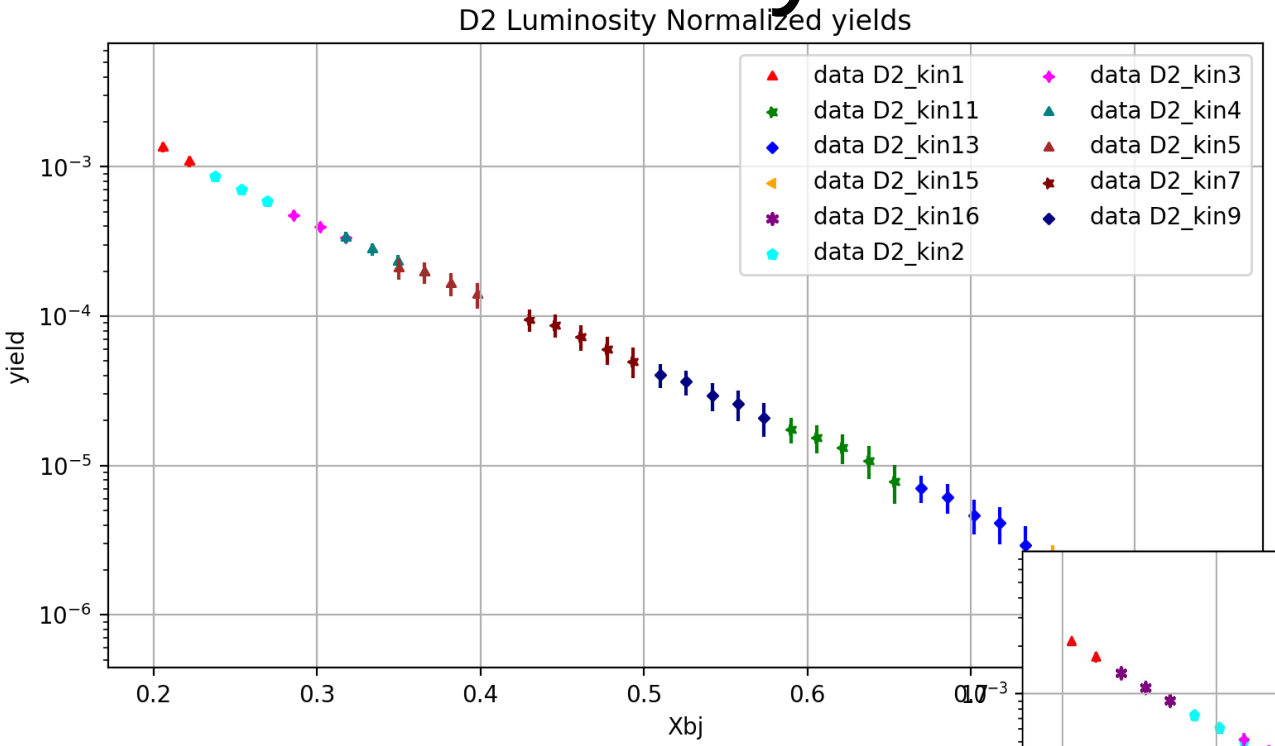
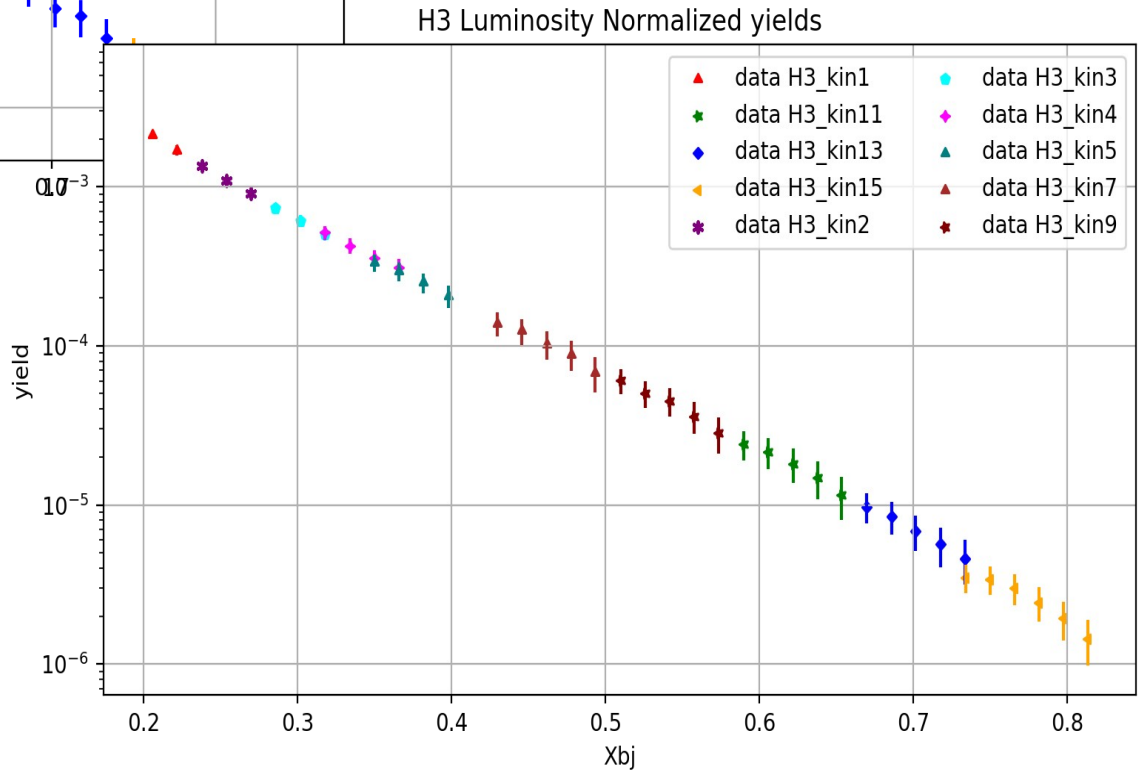
Luminosity normalized Yields





Luminosity normalized Yields

1. $\text{Yield} = \text{Number of Electrons}$ → Raw Count

2. $NormalizedYield_i = \frac{Ne_i}{Luminosity}$ → Comparing runs/ runs of different targets

3. $NormalizedYield_i = \frac{Ne_i}{Luminosity} * Corrections$

Comparing to Monte Carlo or other settings

Luminosity

$$Luminosity_{run} = \frac{Qe_{run} * TargetThickness * Na}{atomicmass}$$

Only the luminosity of a single run, so

sum these up for each run to look normalize an entire setting!

$$TotalLuminosity = \Sigma \frac{Qe_{run} * TargetThickness * Na}{atomicmass}$$

Then include cm2 to NB conversion : 1e33

Corrections

- Live time →

$$LiveTime = \frac{TriggerCount * Prescale}{ScalerCount}$$

- Density Correction is applied by a factor to modify the Target Thickness and correct the luminosity. Use parameters stored in SQL DB to calculate these on a run by run basis.
  - Parameters provide by Tong!
- Positron Correction: Event by event correction, calculate from fits by Tong.

$$PositronCorrection = \frac{e^+}{e^-} \qquad \frac{e^+}{e^- + e^-} \qquad PC = 1 - \frac{e^+}{e^-}$$

Corrections Cont.

- End Cap contamination Table provide by Tong
  - ECC from table in the form of Y_{al}/Y_{tgt}
  - Correction = 1-ECC
- Radiative Corrections
  - Currently use the Bodek Fit in “externals” provided by Dave Gaskell. Same routines shown by Hanjie
  - Generate large 2D table in steps of E` and theta
  - Interpolate between 4 points to approximate the RC factor for that event.

Normalized Yield