Cross Section

$$N_e = L * \left(\frac{d\sigma}{d\Omega dE'}\right) * (\Delta E' \Delta\Omega)\,\epsilon * A(E'\theta) + BackGround$$

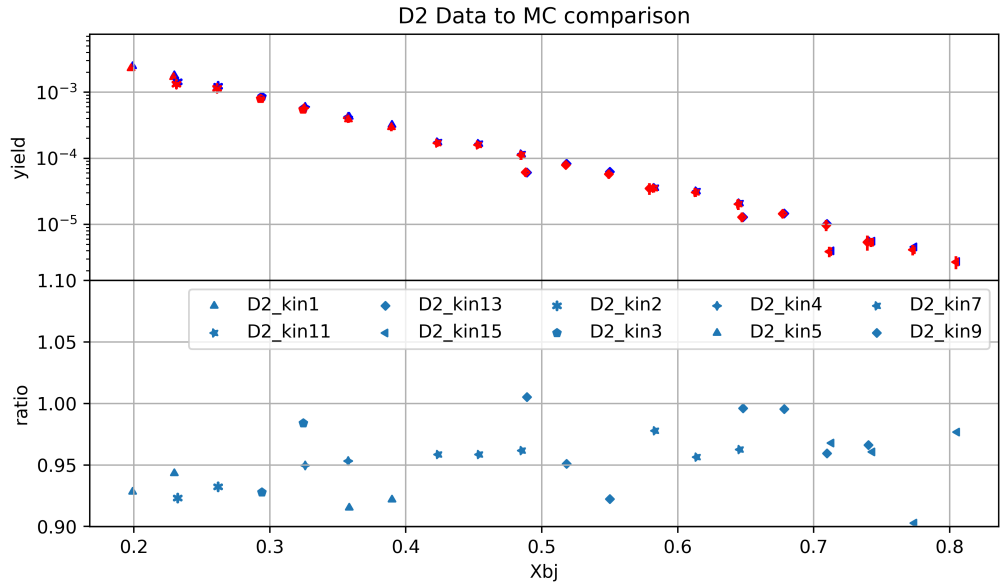
- L Luminosity $\equiv$ # of electrons per scattering centers
- $(\Delta E' \Delta\Omega) =$ size of bin
- $\epsilon =$ efficiencies
- $A(E'\theta) =$ Acceptance

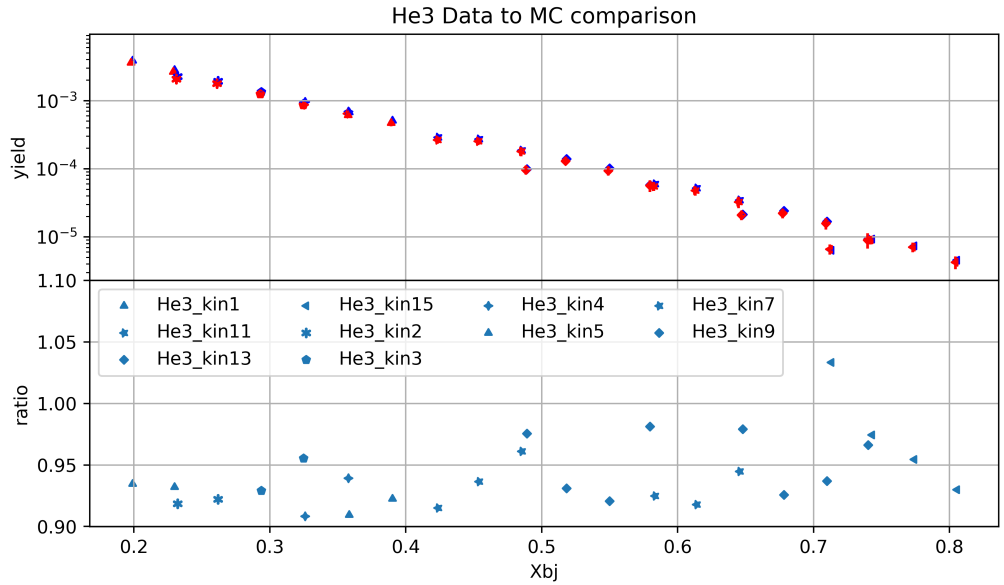
$$Yield_{data} = \frac{(N_e - BackGround)}{Efficency} = L * \sigma^{data} * (\Delta E' \Delta\Omega) * A(E'\theta)$$
$$Yield_{MC} = L * \sigma^{mod} * (\Delta E' \Delta\Omega) * A(E'\theta)$$

Cross section by Monte carlo ratio method: $\frac{d\sigma}{d\Omega dE'} = \sigma^{mod} * \left[\frac{Yield_{data}(E',\theta)}{Yield_{MC}(E',\theta)}\right]$

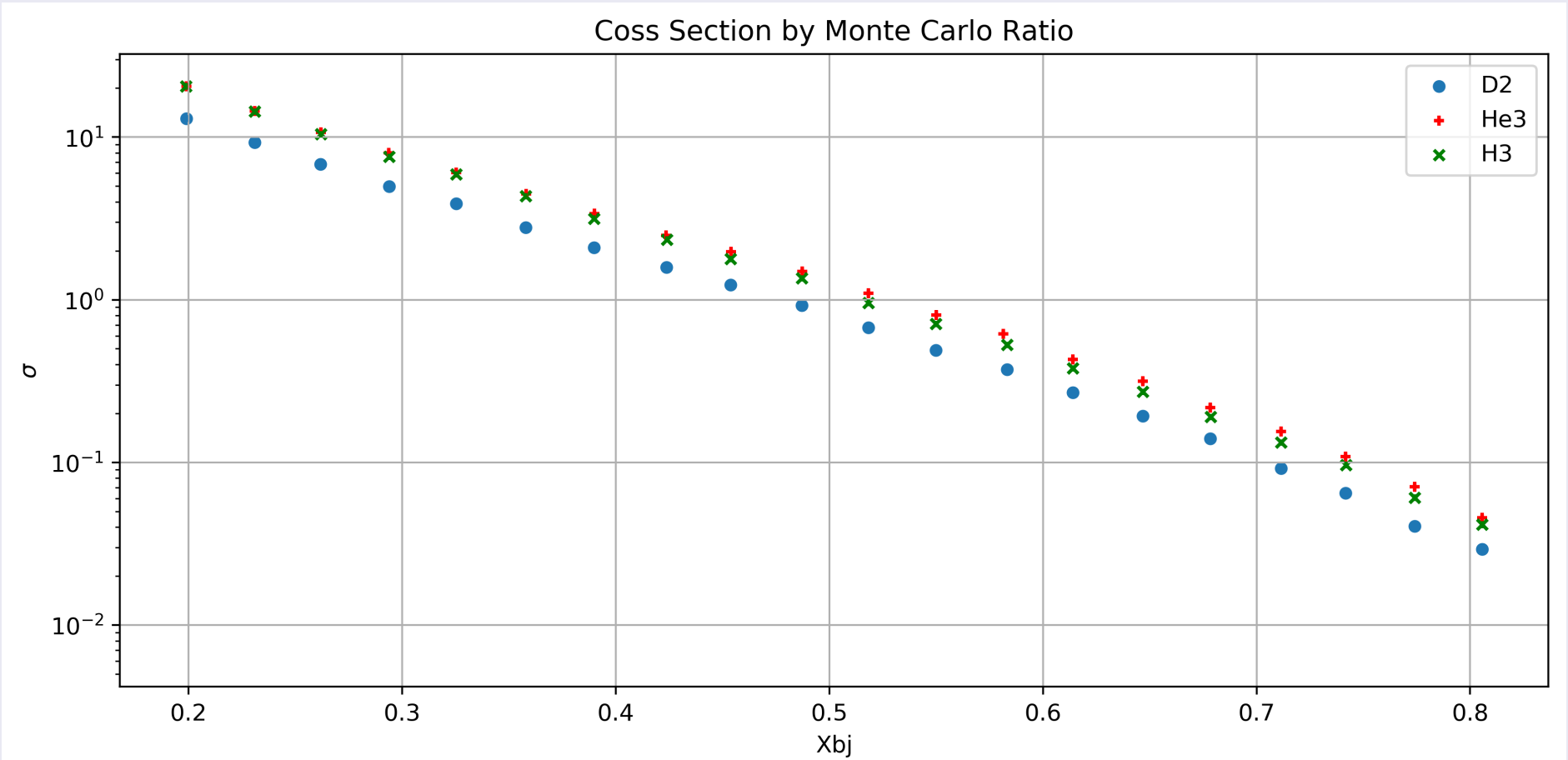
Monte Carlo to Data

- For Deuterium on kin15, we have 66 runs
- Use enough runs to average 10k events per bin
- monitoring the kinematic overlapping region

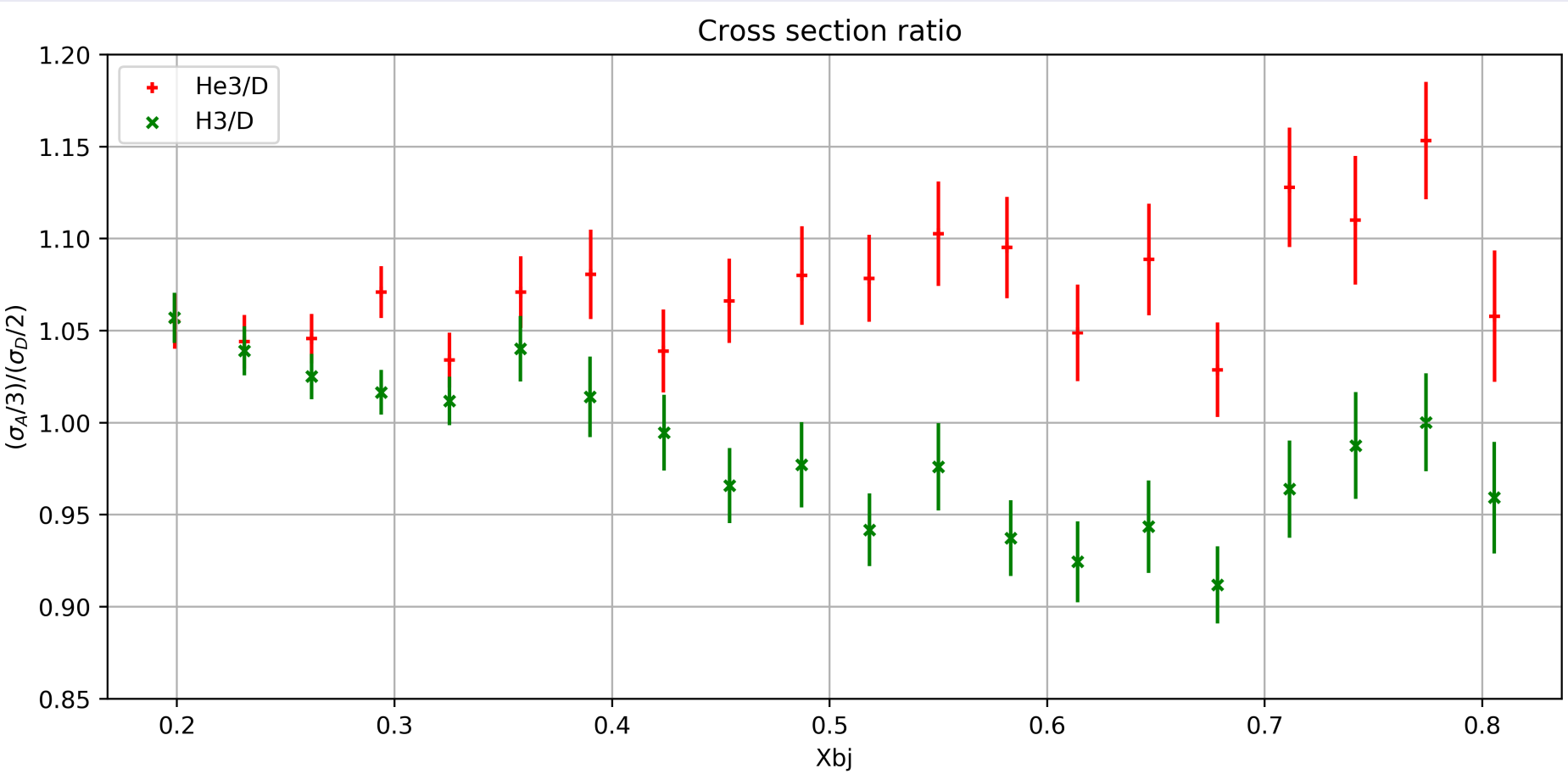




DIS (e,e′) Cross section



EMC effect



- Includes statistical error
- Need to add error from systematic studies