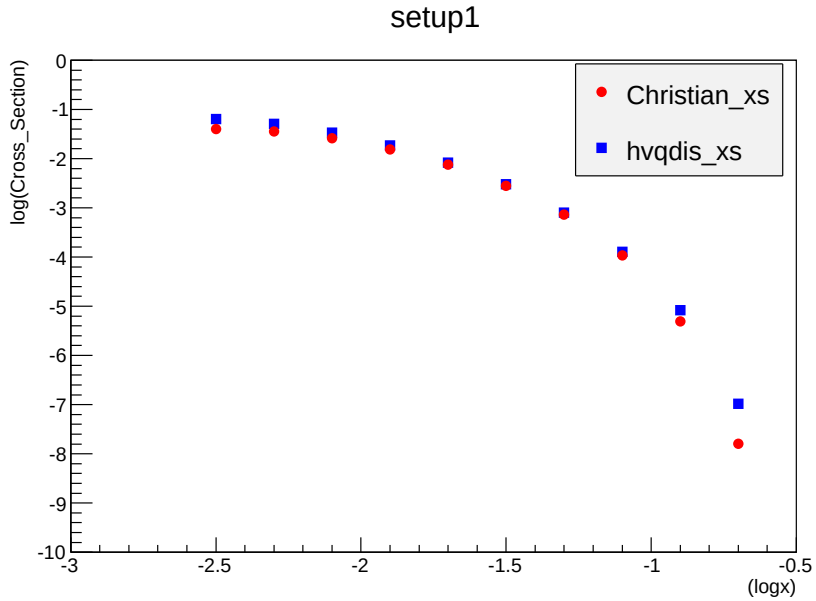
Open charm production on nucleon: Testing simulation tools

Dien Nguyen, C. Weiss, LDRD Project "Nuclear gluons with charm at EIC," Meeting 16-Mar-16

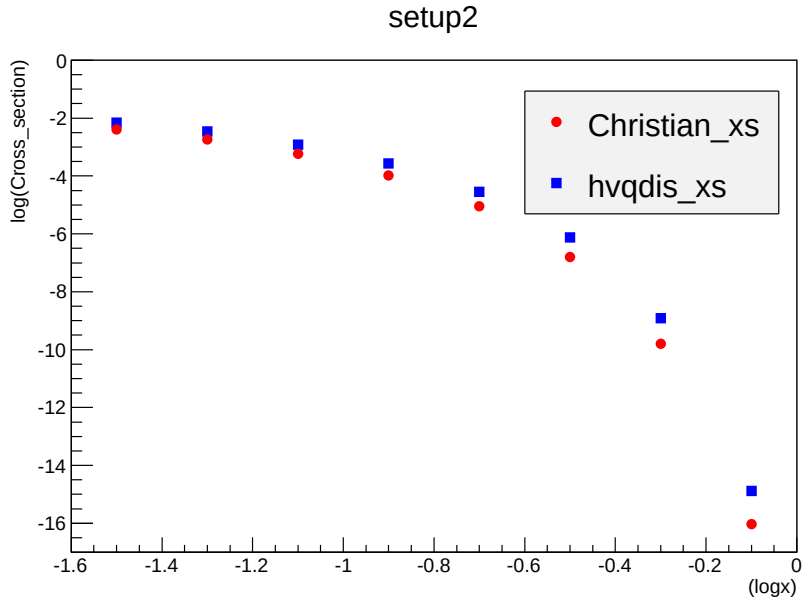
Compare charm DIS cross section from HVQDIS
with numerical integral of LO QCD expression

- LO QCD formulas from Glück-Reya-Stratmann NPB 422, 37 (1994) [INSPIRE]
- Numerical integration over finite (x, Q^2) bin
- Independent code from HVQDIS: cross sections, flux factors
- Compare charm cross sections integrated over (x, Q^2) bins

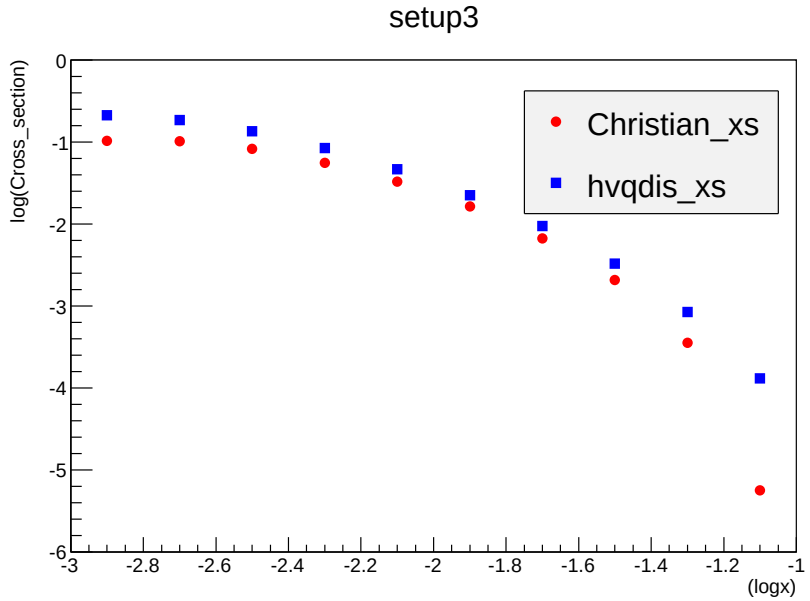
HVQDIS vs. numerical integration



$s = 4000, Q^2 = [5, 10]$



$s = 4000, Q^2 = [20, 100]$



$s = 10000, Q^2 = [5, 10]$

- Overall agreement very reasonable
- 20-30% mostly, up to factor 2 at large Q^2 (ignore $x \to 1$)
- Approximations: Partonic kinematics, phase space integration?
- Sufficient for rate estimates