Inclusive Data, Current and Projections

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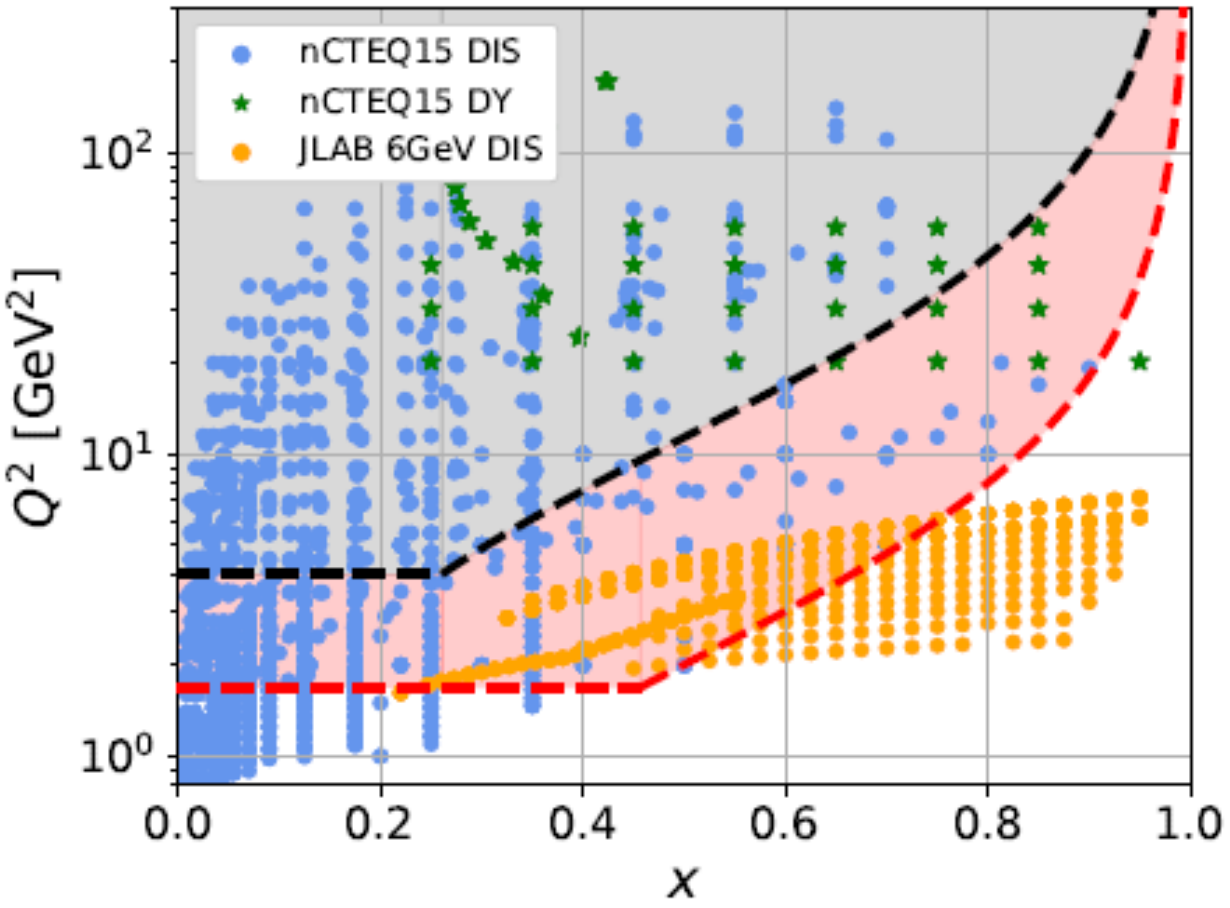
World Data: BCDMS, EMC, NMC, SLAC, FNAL, Hermes, JLab

Targets:
He, Be, Li, C, N, Al, Ca,
Fe, Cu, Kr, Ag, Sn, Xe,
Au, Pb

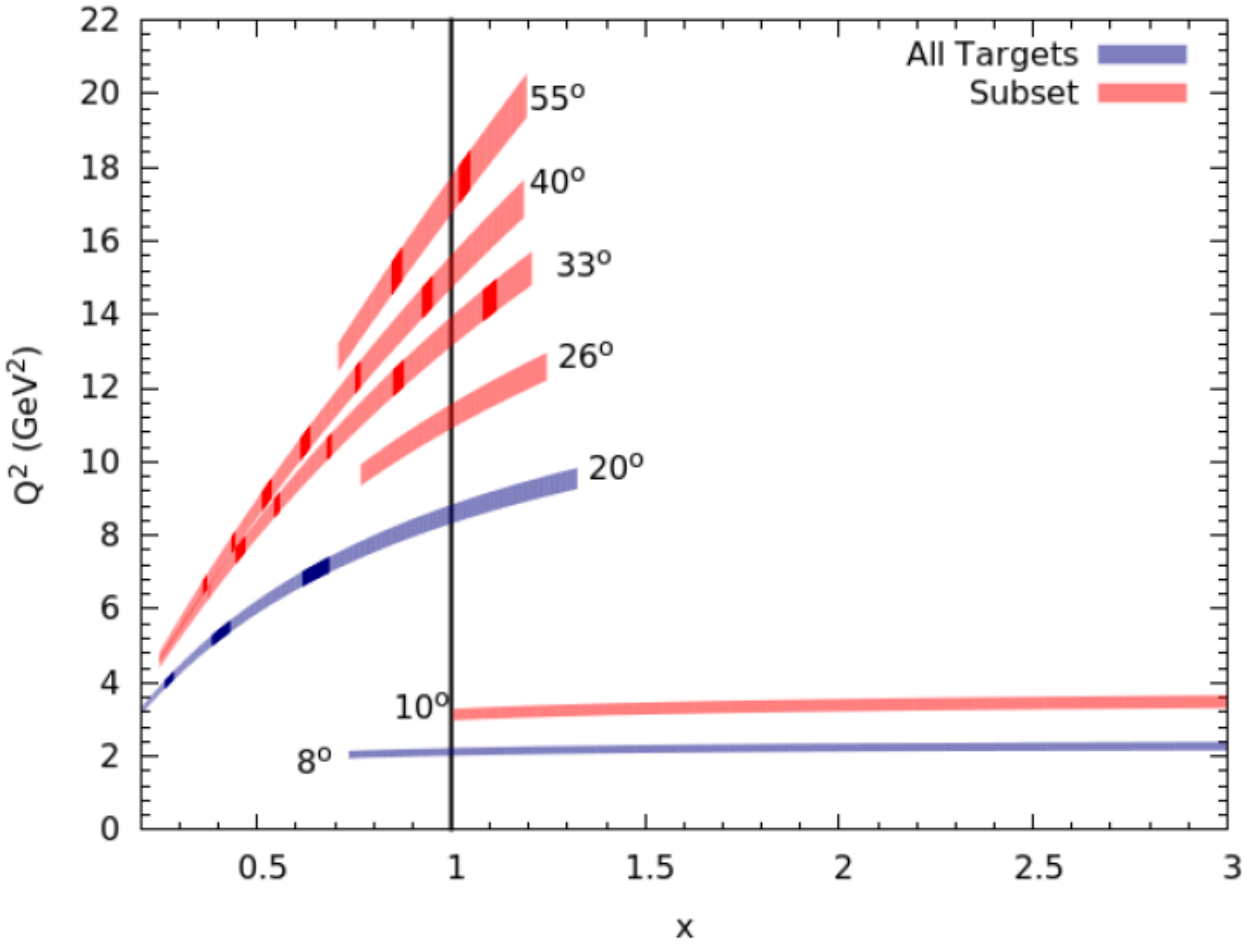


nCTEQ15HIX — Extending nPDF Analyses into the High-x, Low-Q2 Region, E.P. Segarra *et al.*, Phys. Rev. D 103, 114015 (2021)

Upcoming Hall C Data: E12-06-105 and E12-10-008

Targets:

He3, He4, Li, Be, B10, B11, C, Al, Ca40,Ca48, Ti, Fe, Ni58, Ni64, Sn, Cu, Ag, Au, Th.

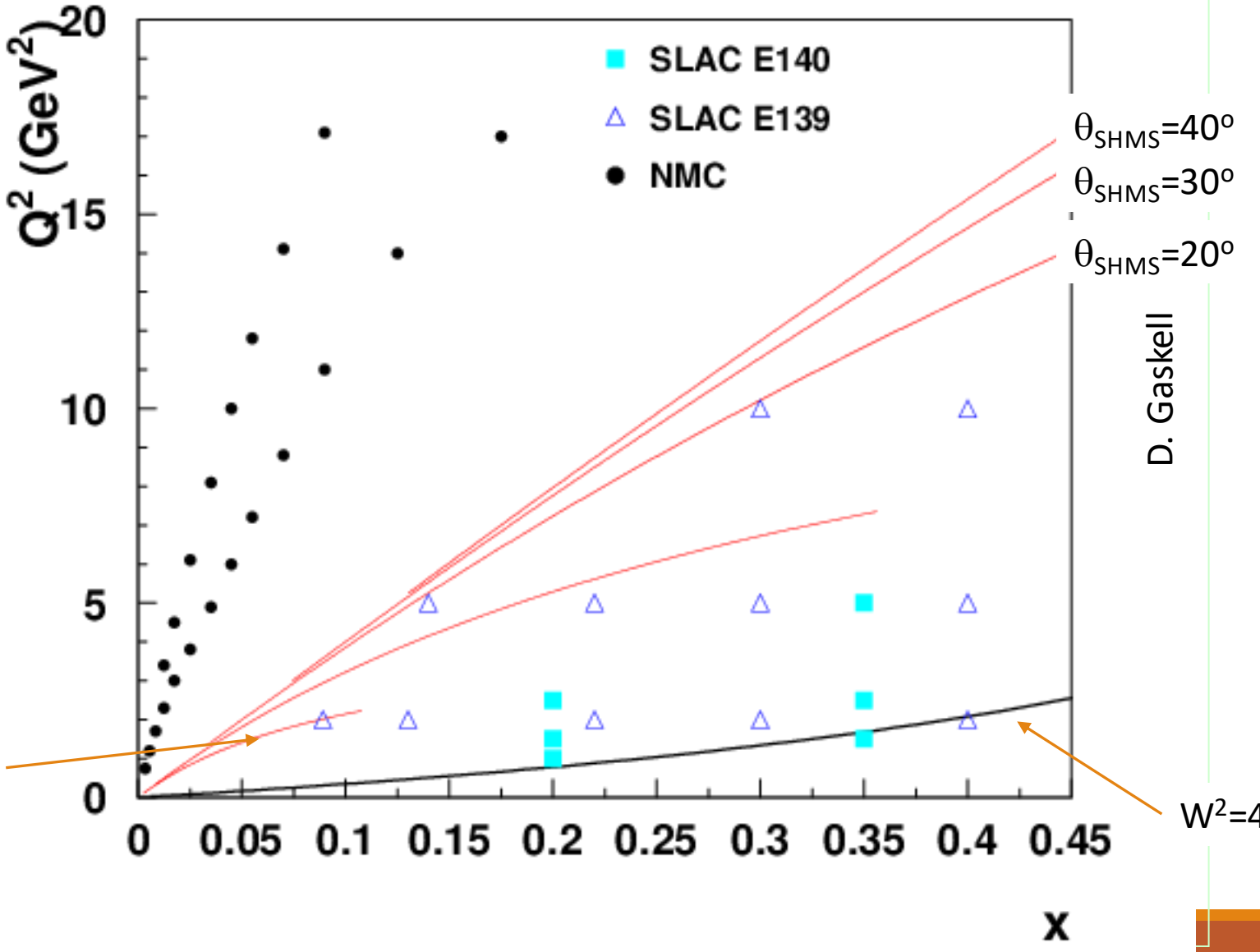


Upgrade Jlab to 22 GeV

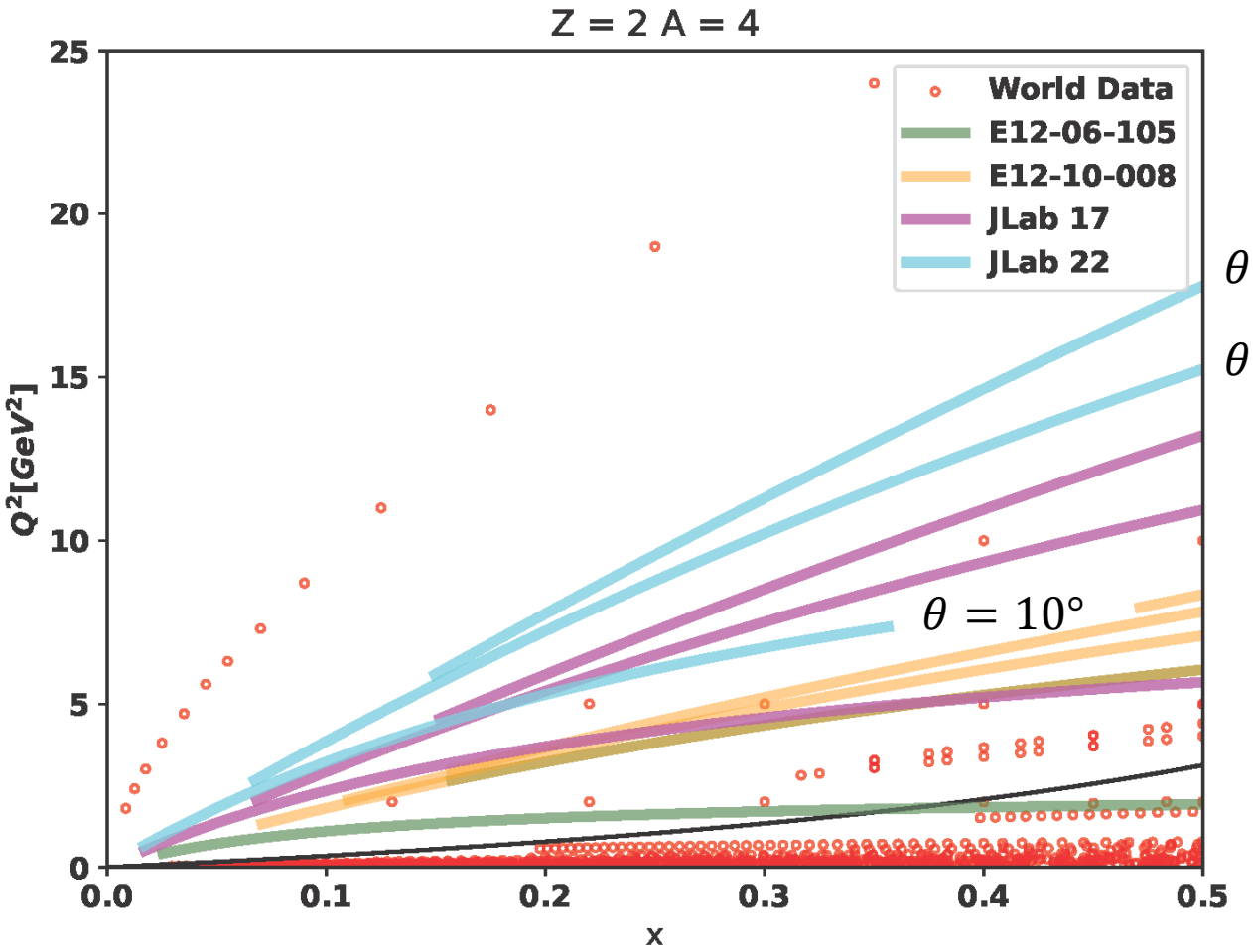
→Ebeam=22 GeV

→SHMS at various angles (red curves)

→P=0.5-11 GeV/c

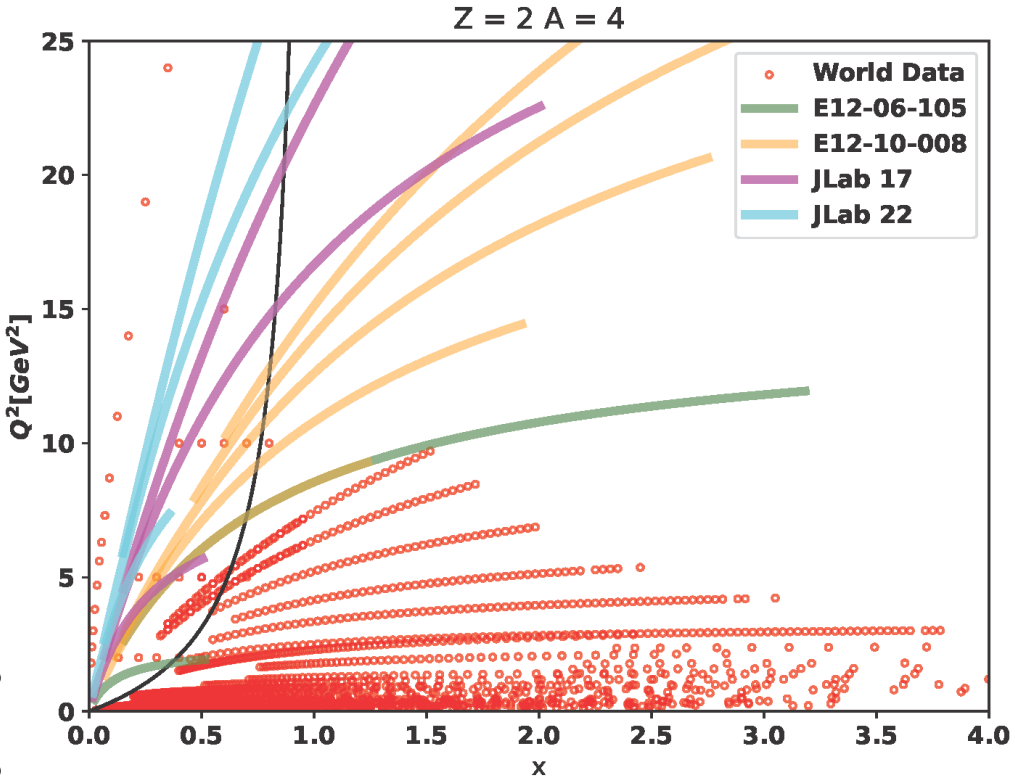


He-4

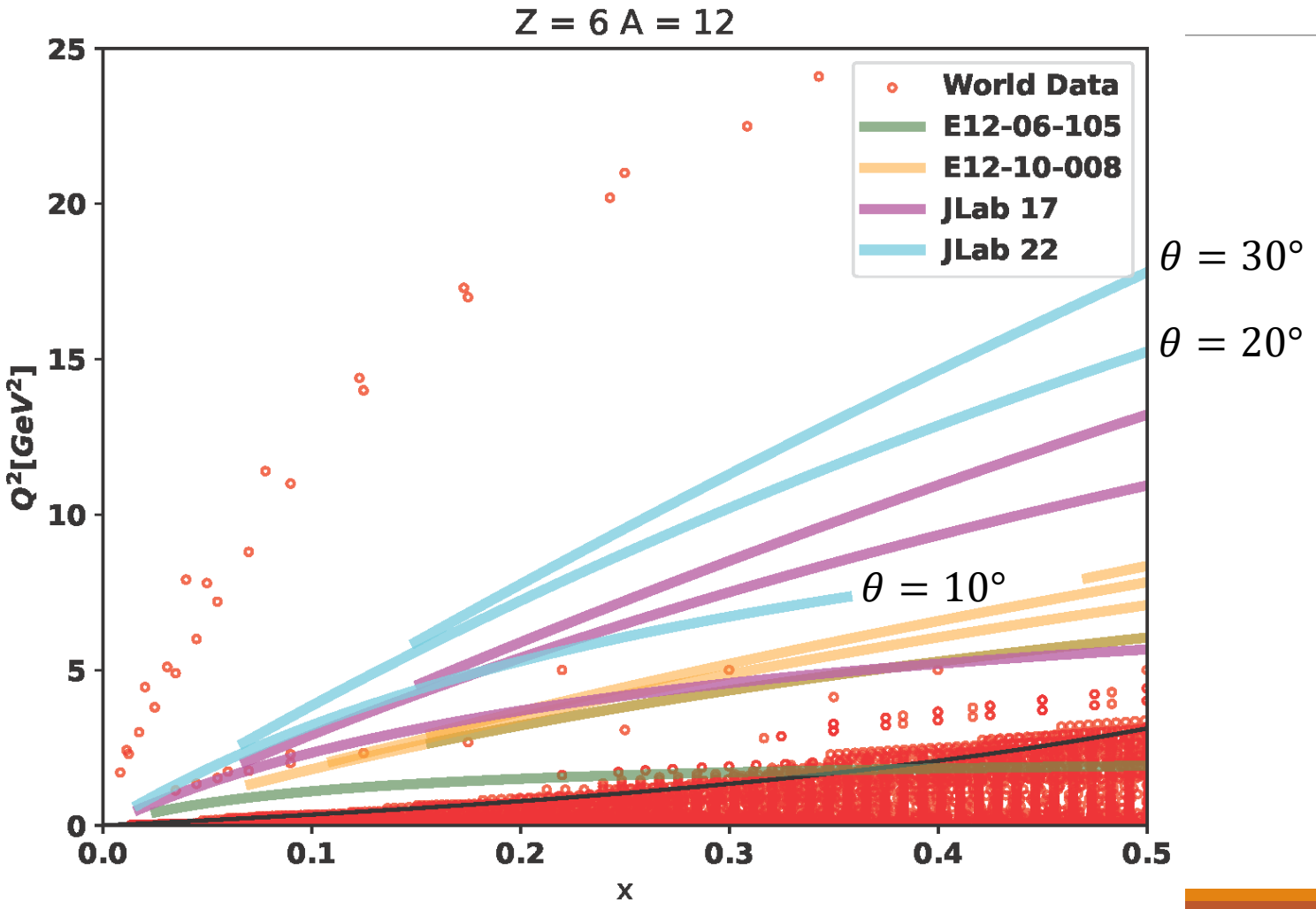


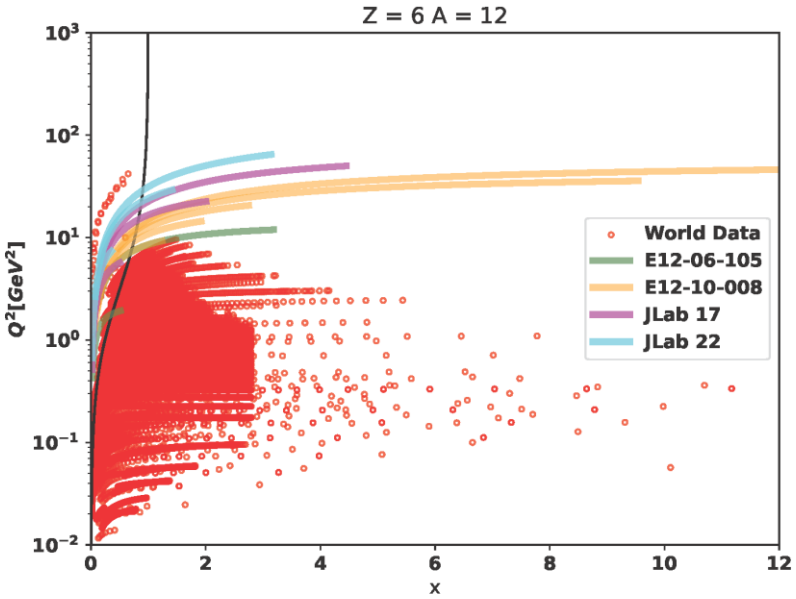
$\theta = 30°$

$\theta = 20°$

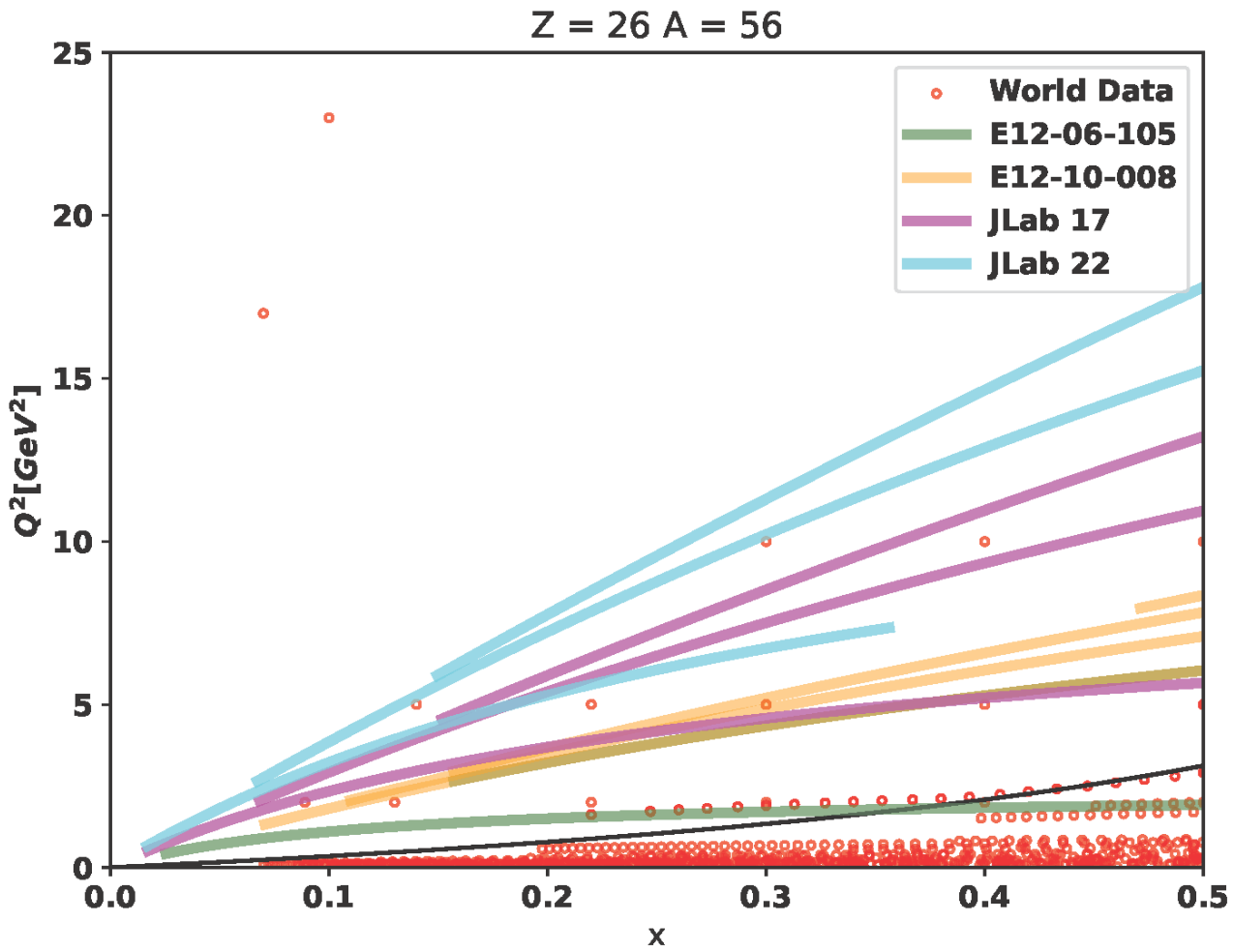


C-12

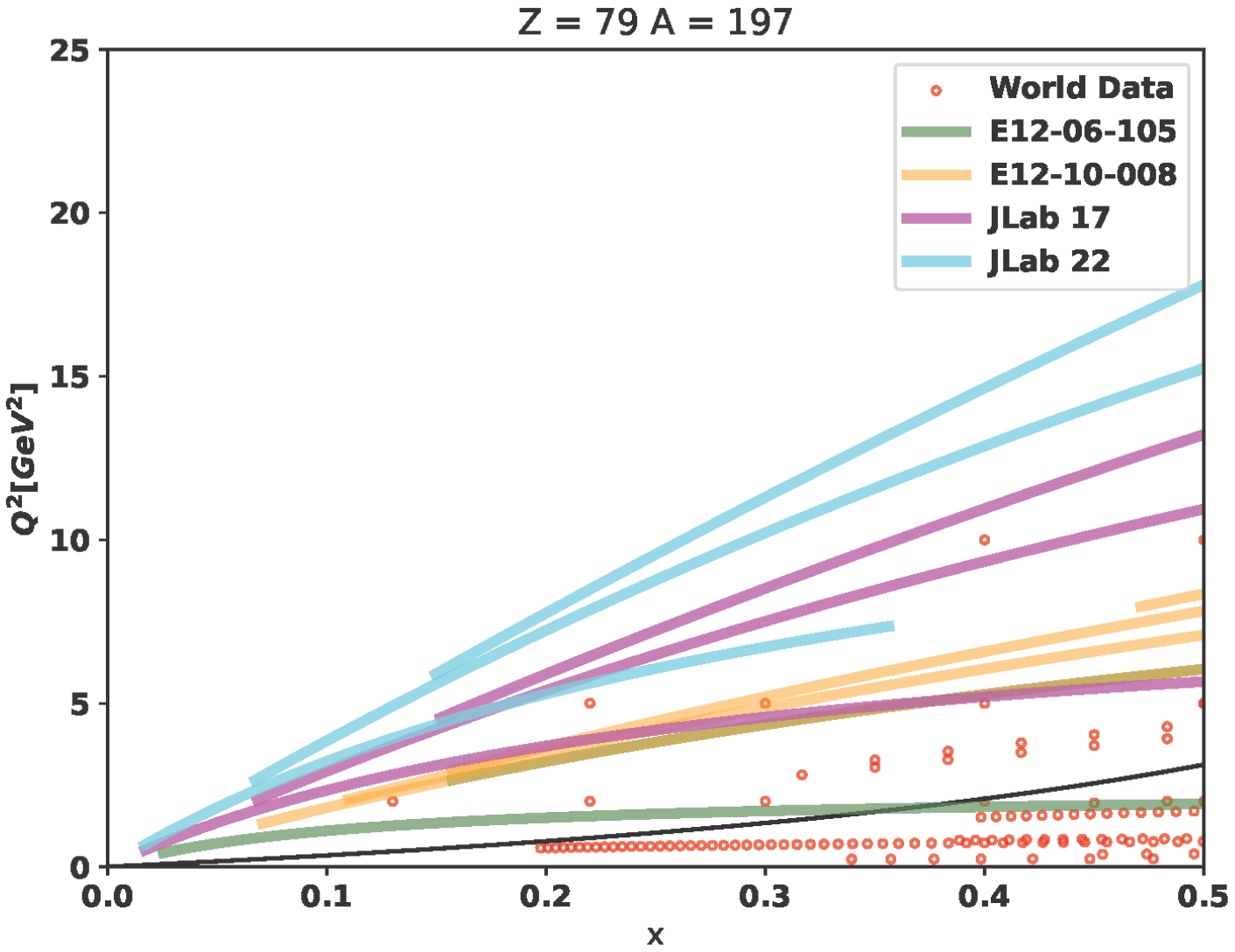

Z = 6 A = 12
World Data
E12-06-105
E12-10-008
JLab 17
JLab 22
$\theta = 30°$
$\theta = 20°$
$\theta = 10°$
Q^2[GeV^2]
x


Z = 6 A = 12
World Data
E12-06-105
E12-10-008
JLab 17
JLab 22
Q^2[GeV^2]
x

Fe-56

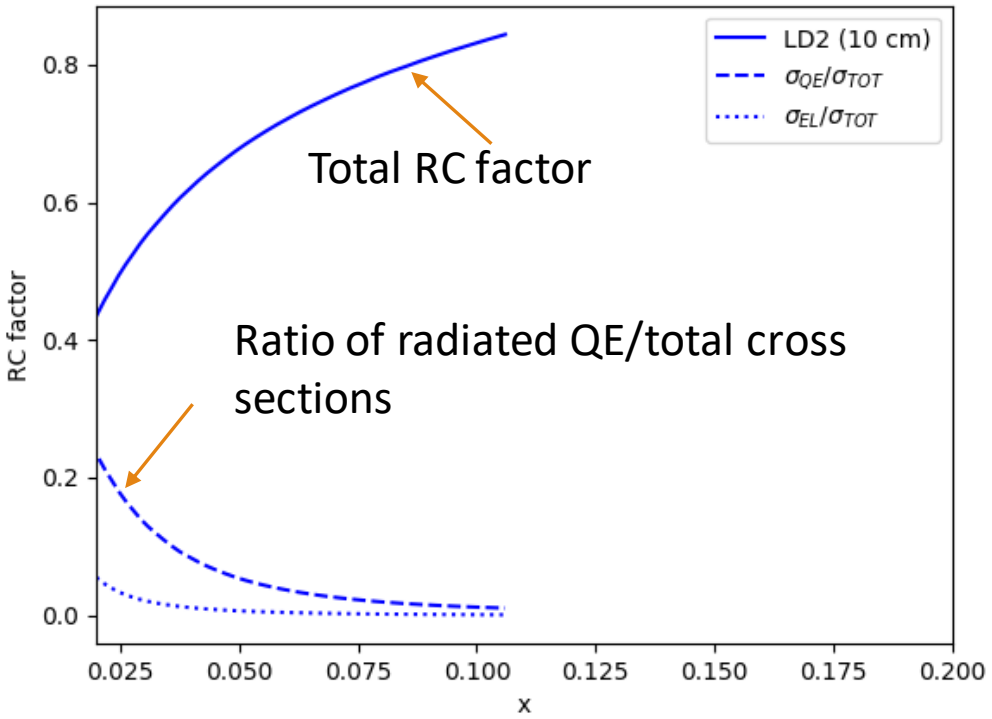

Z = 26 A = 56
World Data
E12-06-105
E12-10-008
JLab 17
JLab 22
Q^2[GeV^2]
x
0
5
10
15
20
25
0.0
0.1
0.2
0.3
0.4
0.5

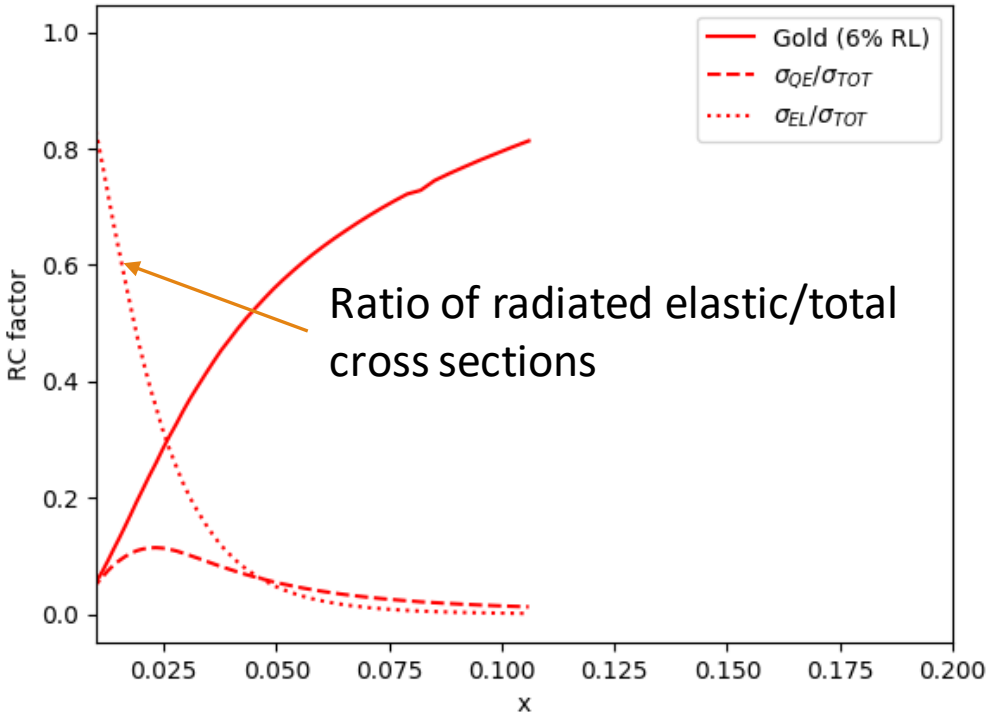
Au-197


Z = 79 A = 197
World Data
E12-06-105
E12-10-008
JLab 17
JLab 22
$Q^2[GeV^2]$
x
0
5
10
15
20
25
0.0
0.1
0.2
0.3
0.4
0.5

Radiative Corrections
(calculations by D. Gaskell)

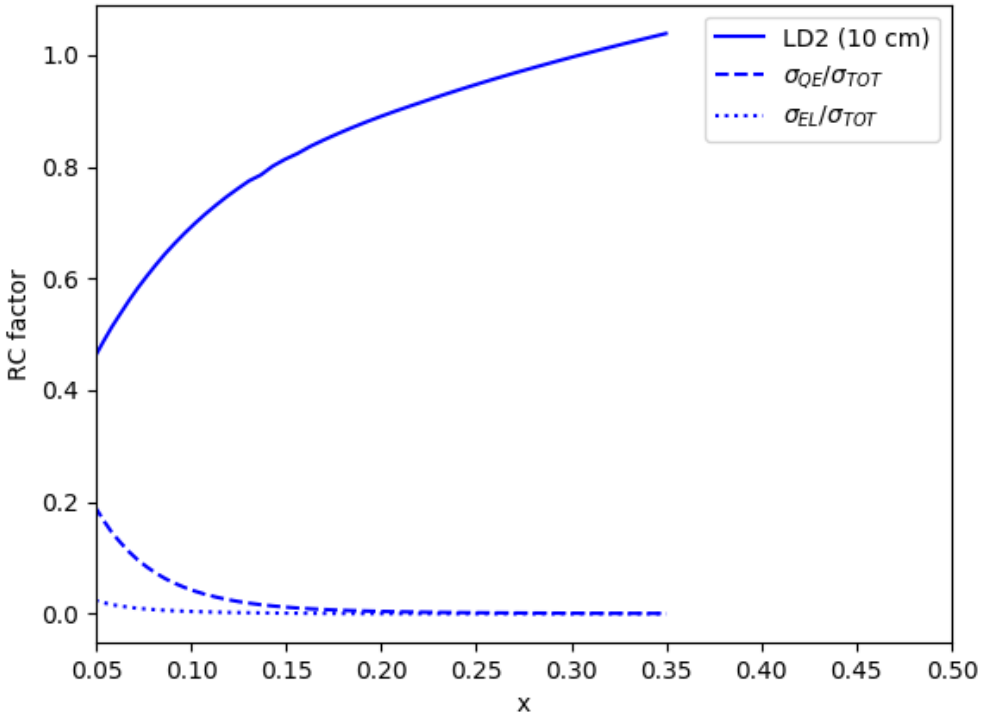
SHMS at 5.5 degrees

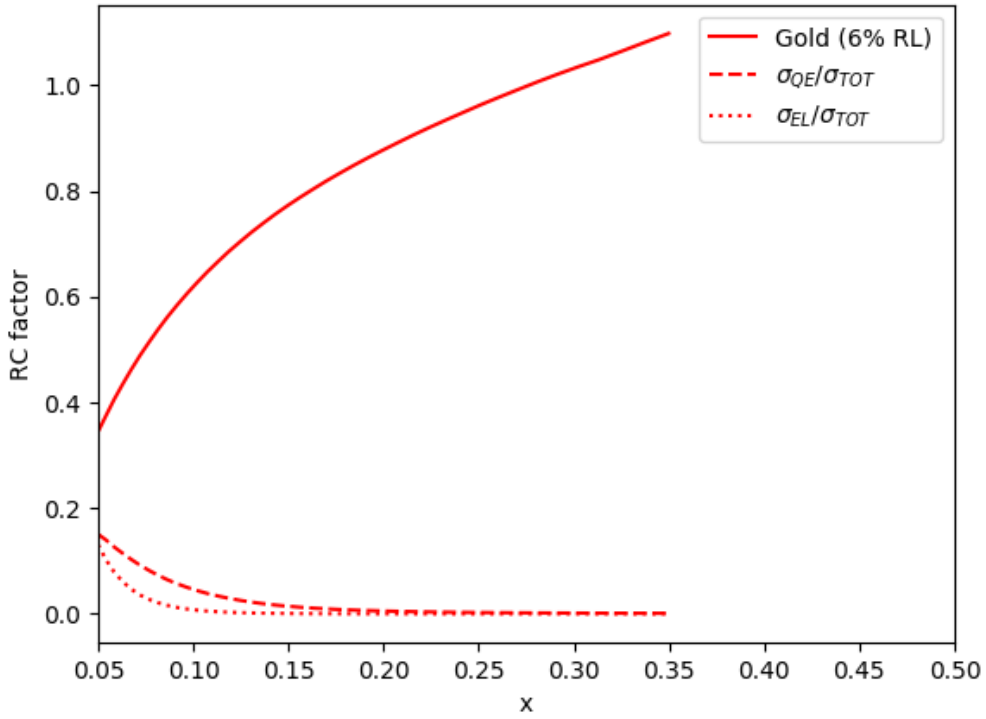




Radiative Corrections

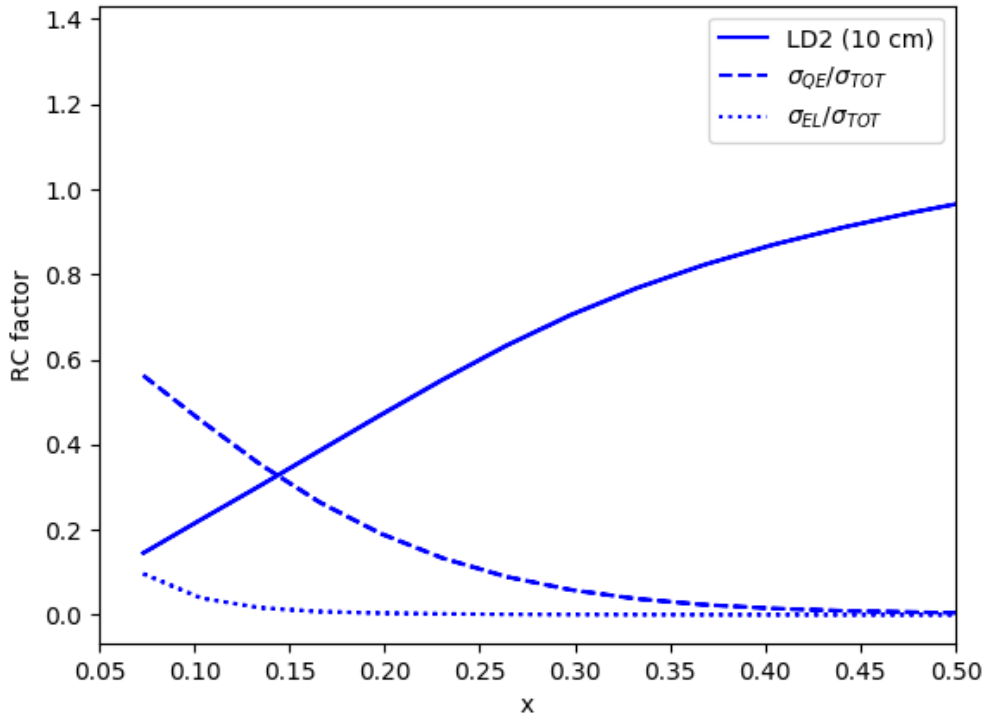
SHMS at 10 degrees

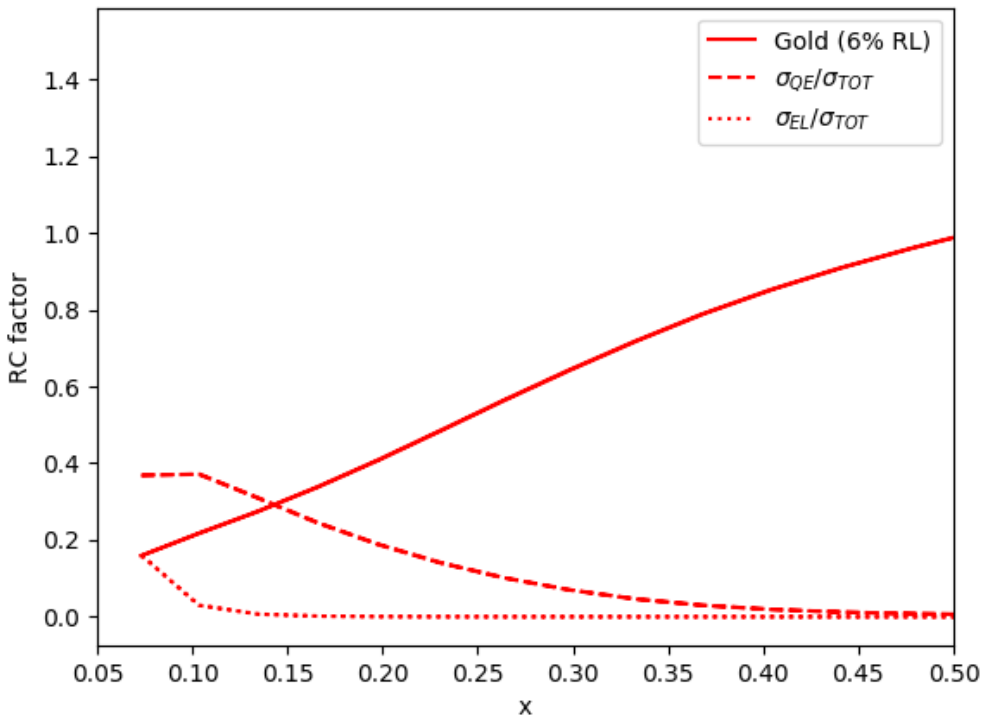




Radiative Corrections

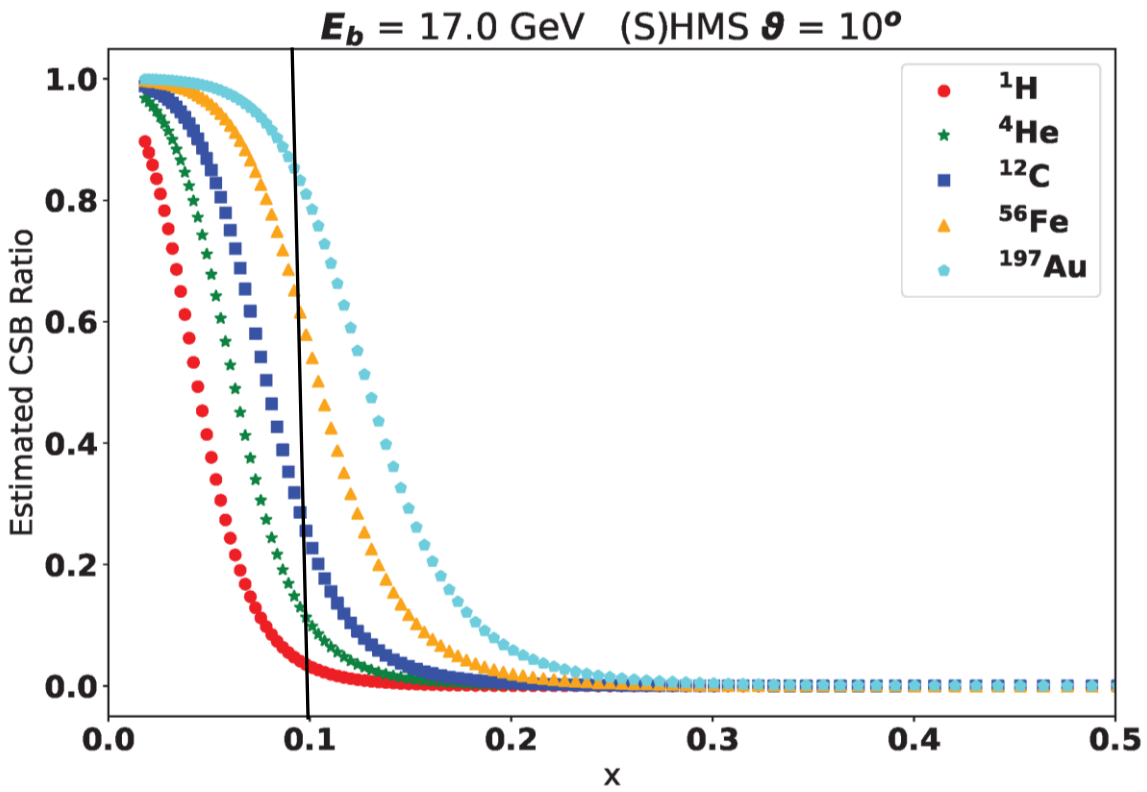
SHMS at 30 degrees

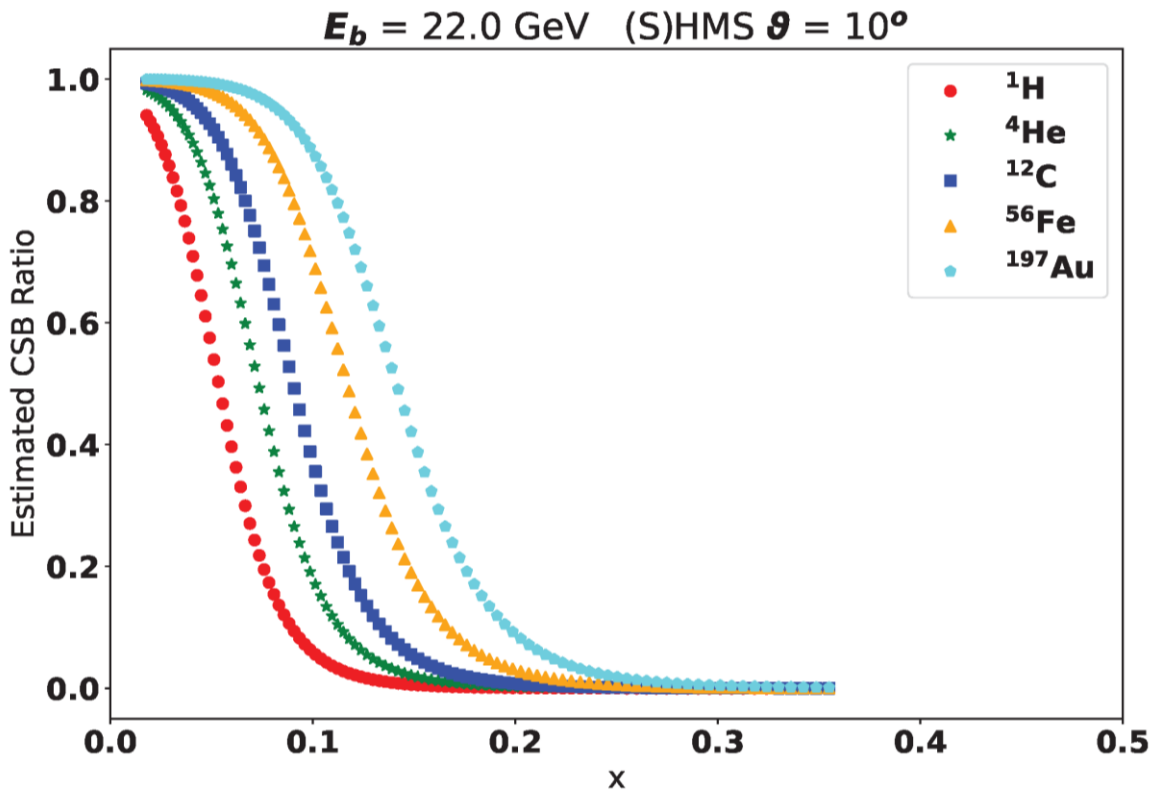




Charge Symmetric Background
(calculations by G. Niculescu using P. Bosted code)

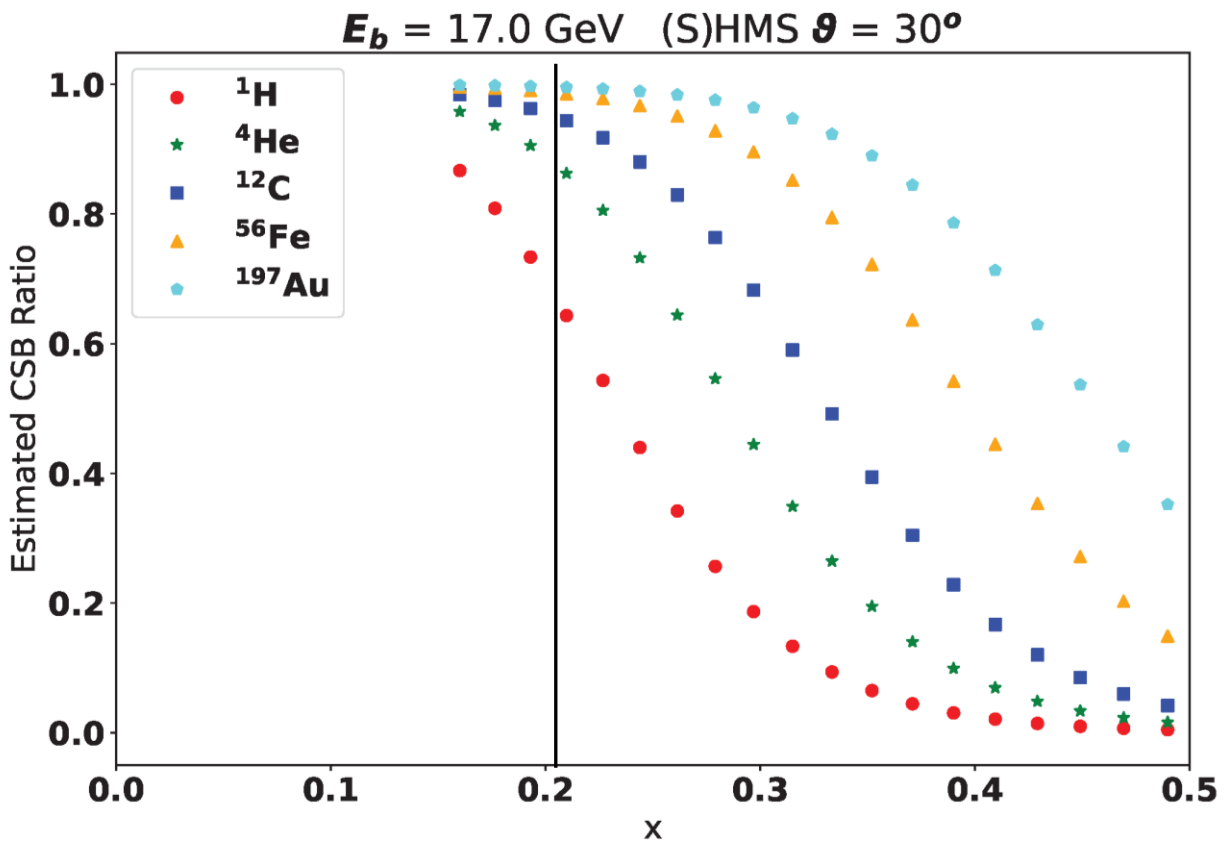
(S)HMS at 10 degrees

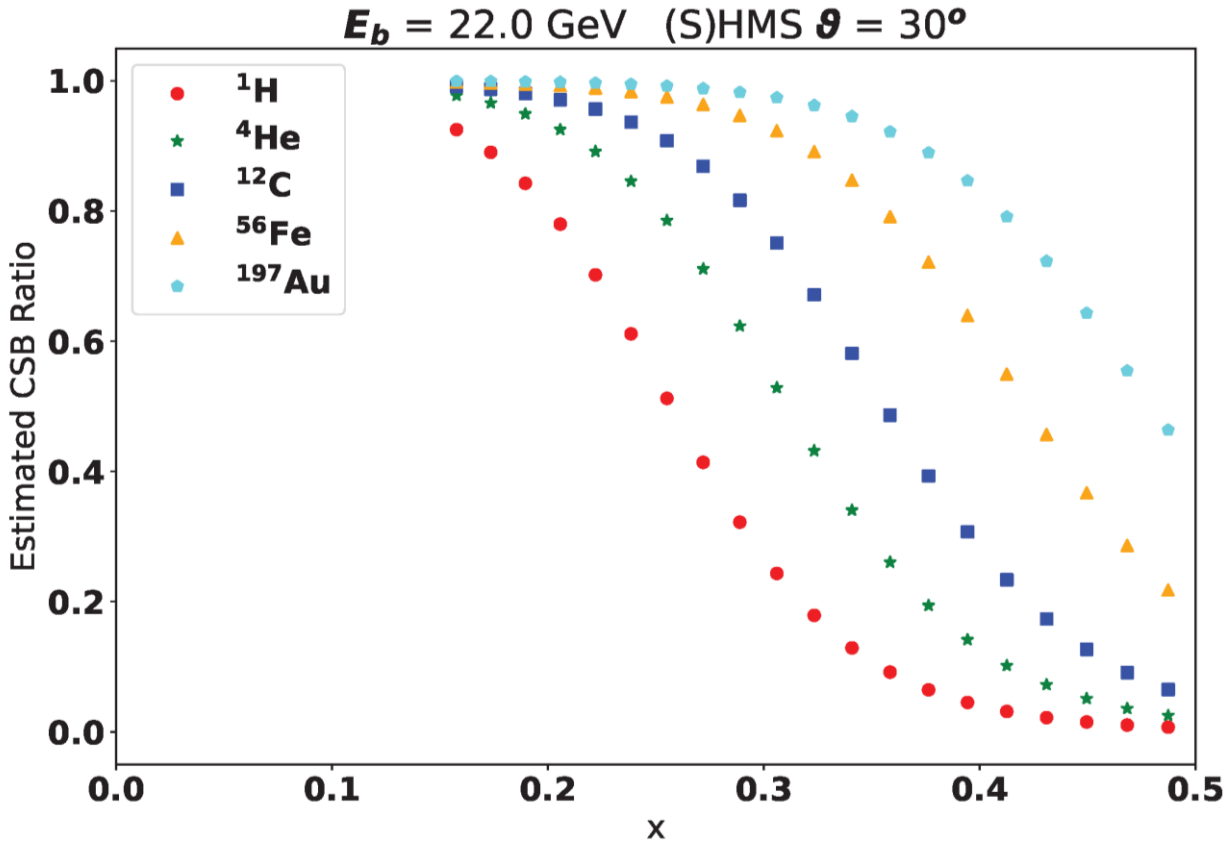




Charge Symmetric Background

(S)HMS at 30 degrees

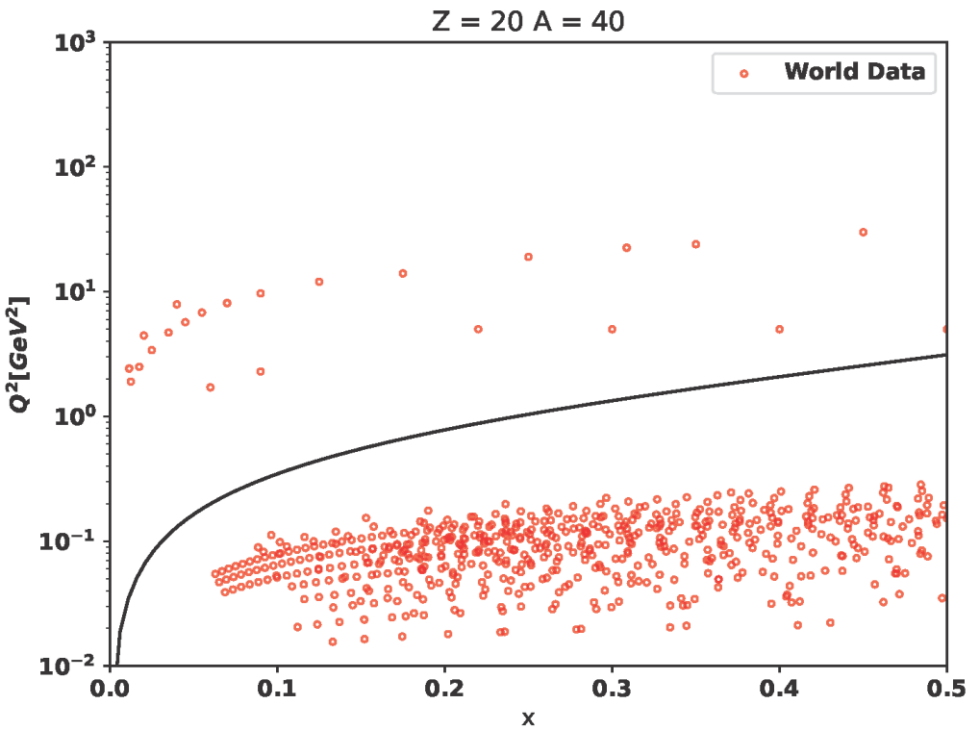


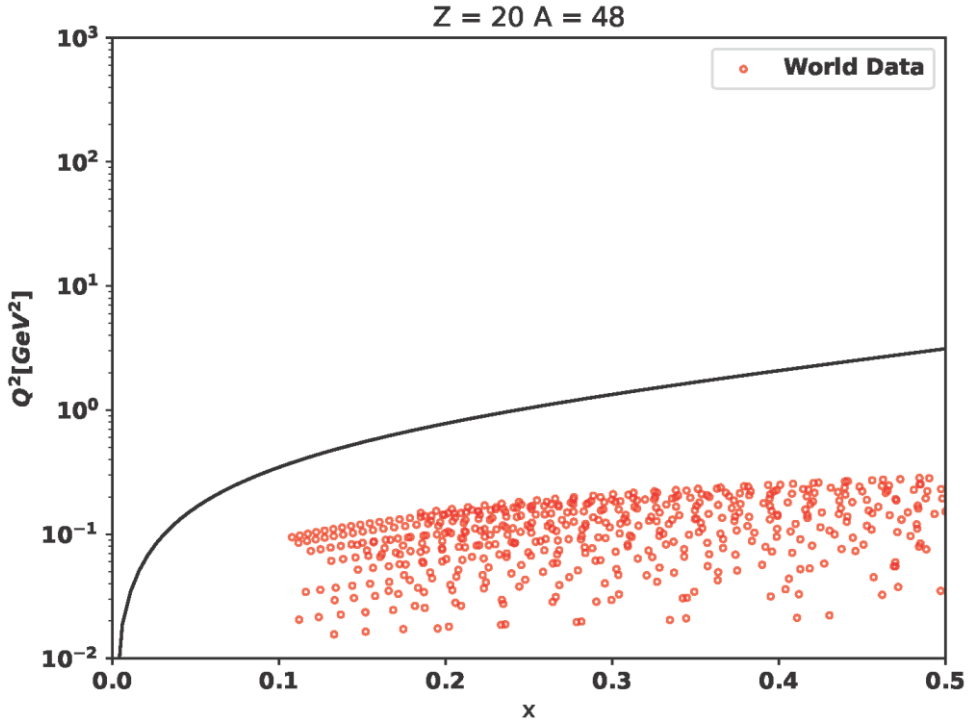


Summary and Outlook

Mid-x region is challenging: high RC and CSB corrections.

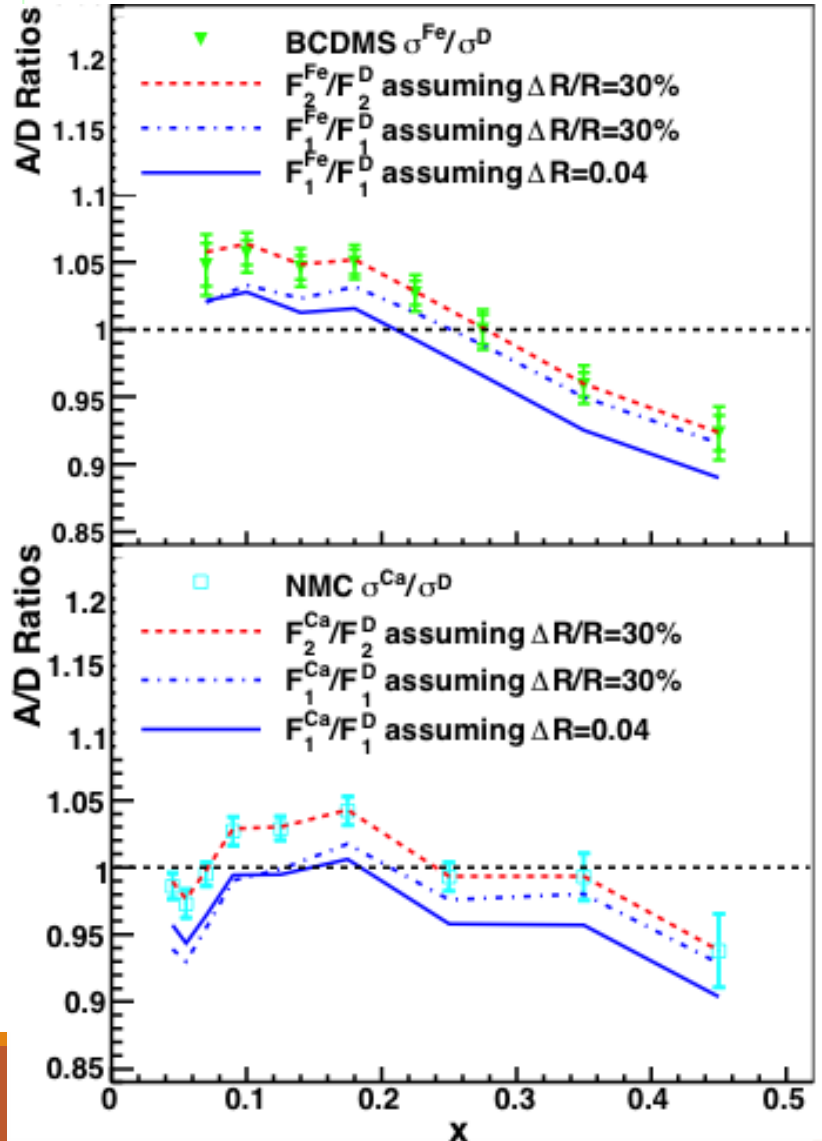
What measurements would be interesting in inclusive (e,e')?





Nuclear Dependence of R

D. Gaskell



$$\frac{\sigma_A}{\sigma_D} = \frac{F_1^A(x)}{F_1^D(x)}\left[1 + \frac{\epsilon(R_A - R_D)}{1 + \epsilon R_D}\right]$$

F_1 ratio purely transverse

Anti-shadowing disappears for F_1 ratio, remains for F_2

Anti-shadowing from longitudinal photons?

V. Guzey et al, PRC 86 045201 (2012)