

xFitter Examples & Applications

Case Study: The Strange Case of the Strange PDF



... can we solve it???

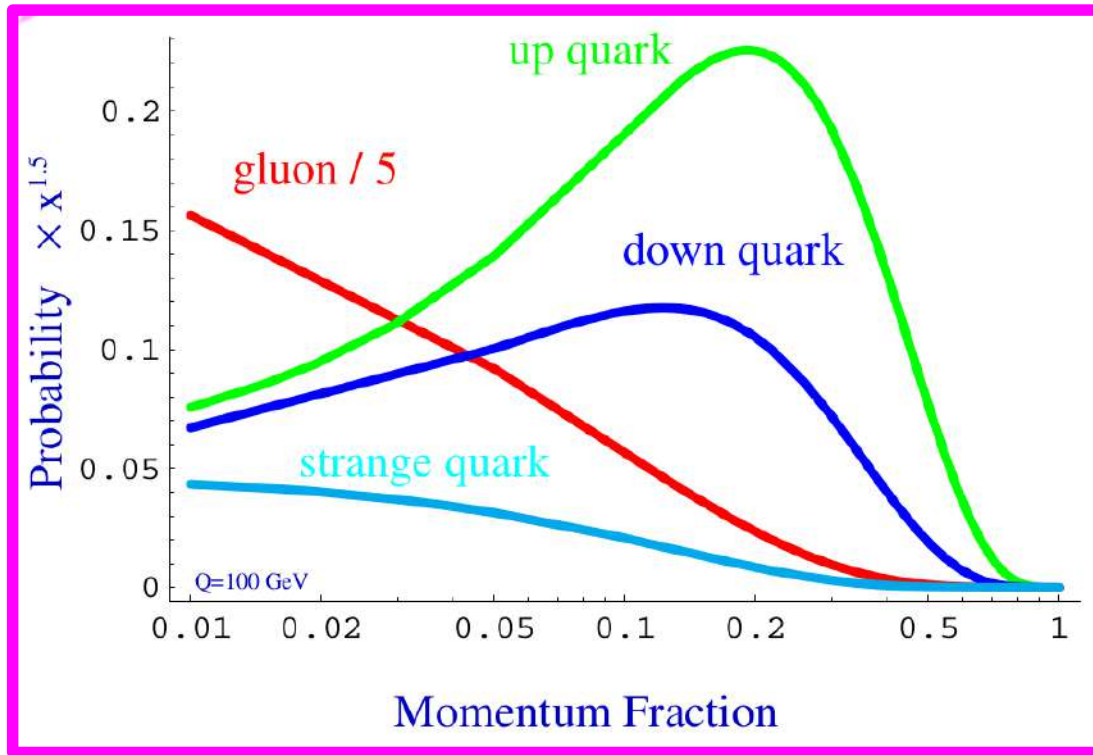
Peter Risse & Fred Olness
SMU

*Thanks for substantial input
from my friends & colleagues*



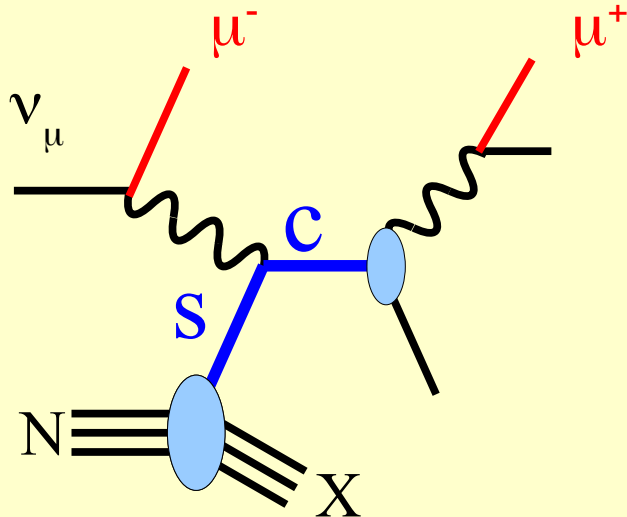
nCTEQ
nuclear parton distribution functions

2025 CFNS-SURGE
Stony Brook University
5 June 2025

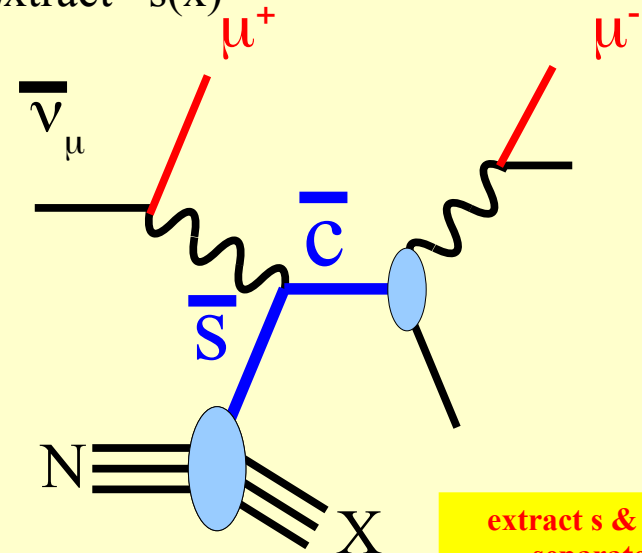


Need to “dig out” $s(x)$ underneath $d(x)$

Extract $s(x)$

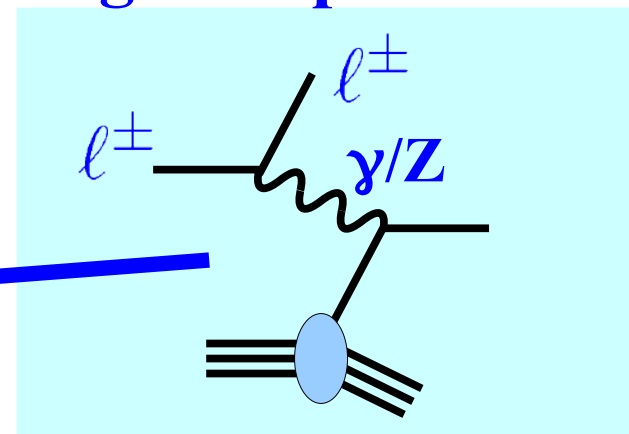


Extract $\bar{s}(x)$



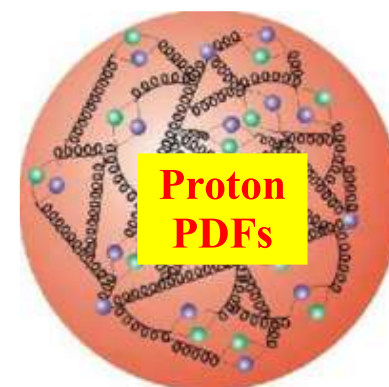
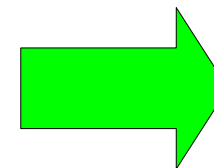
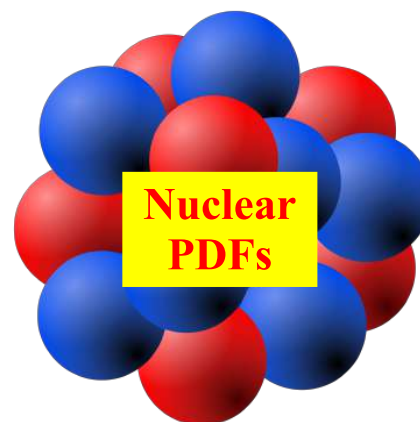
extract s & s -bar separately

Charged Lepton DIS



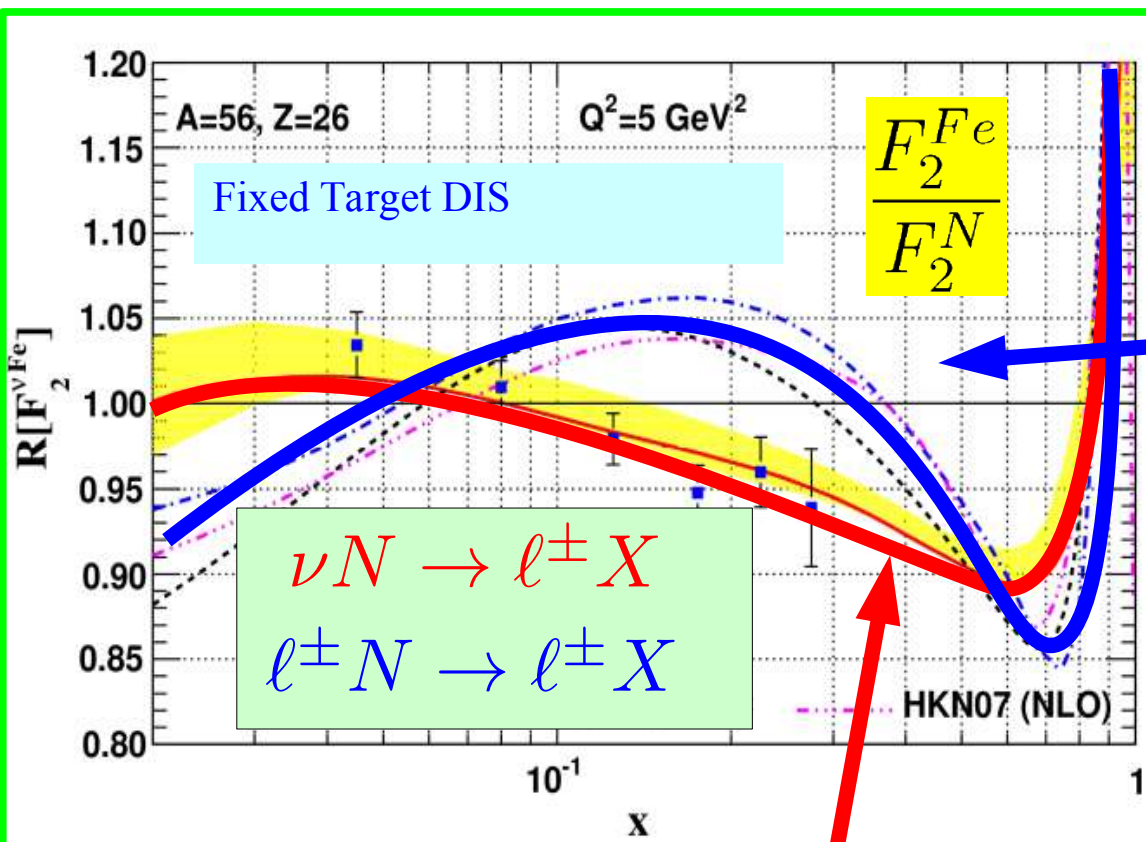
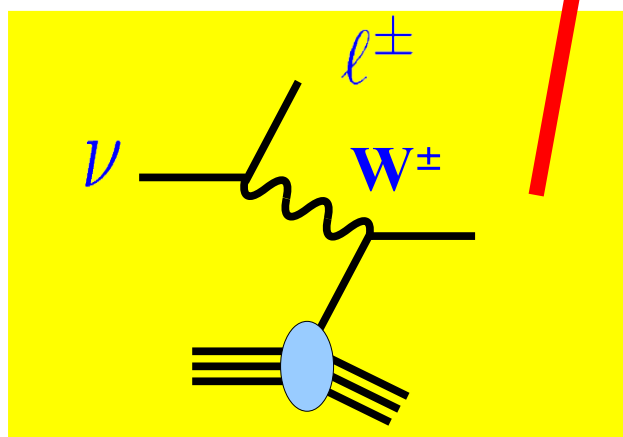
*some caveats
... correlated errors*

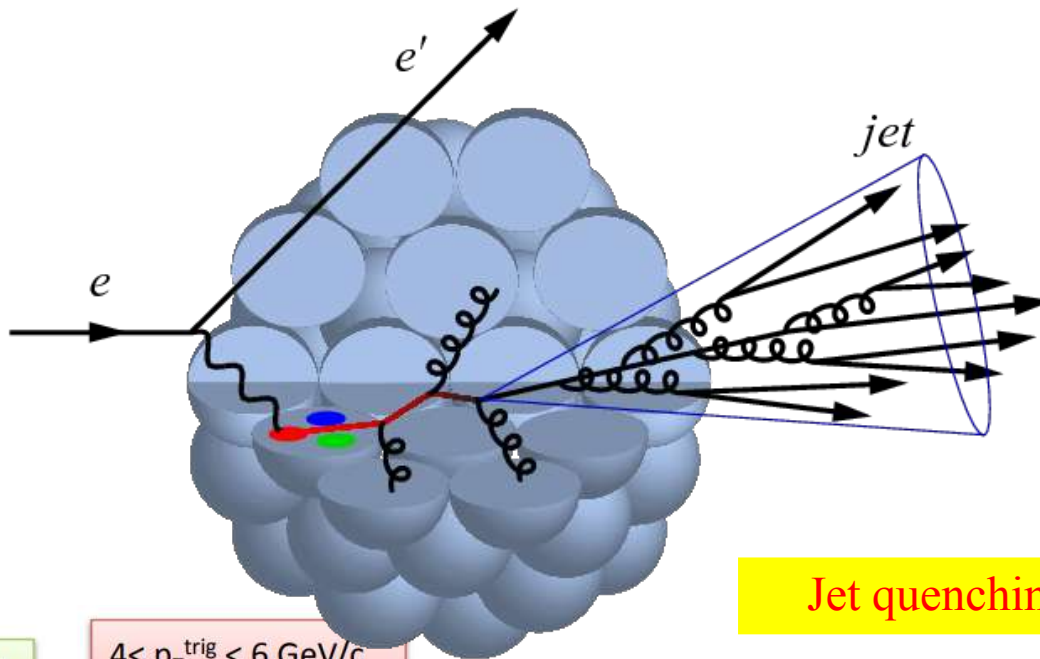
Depends on nuclear corrections



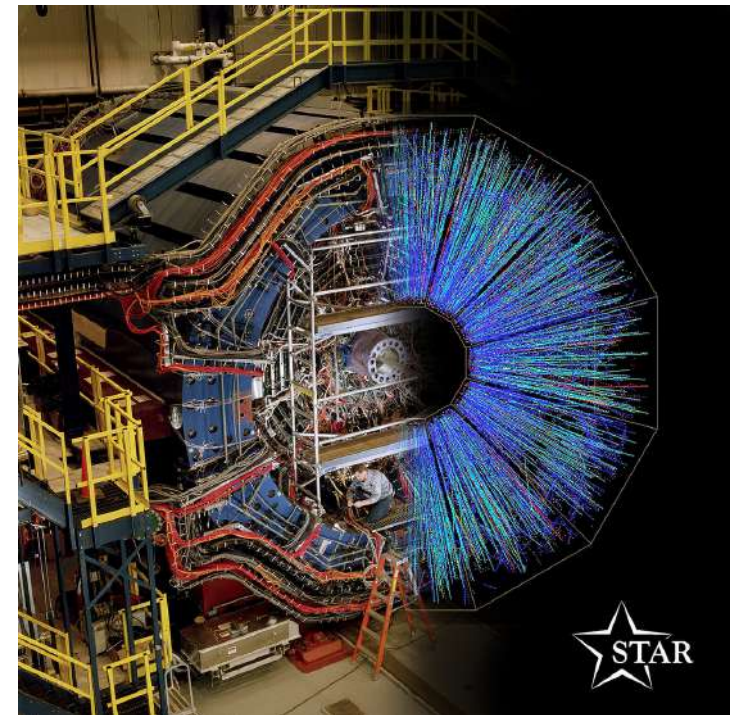
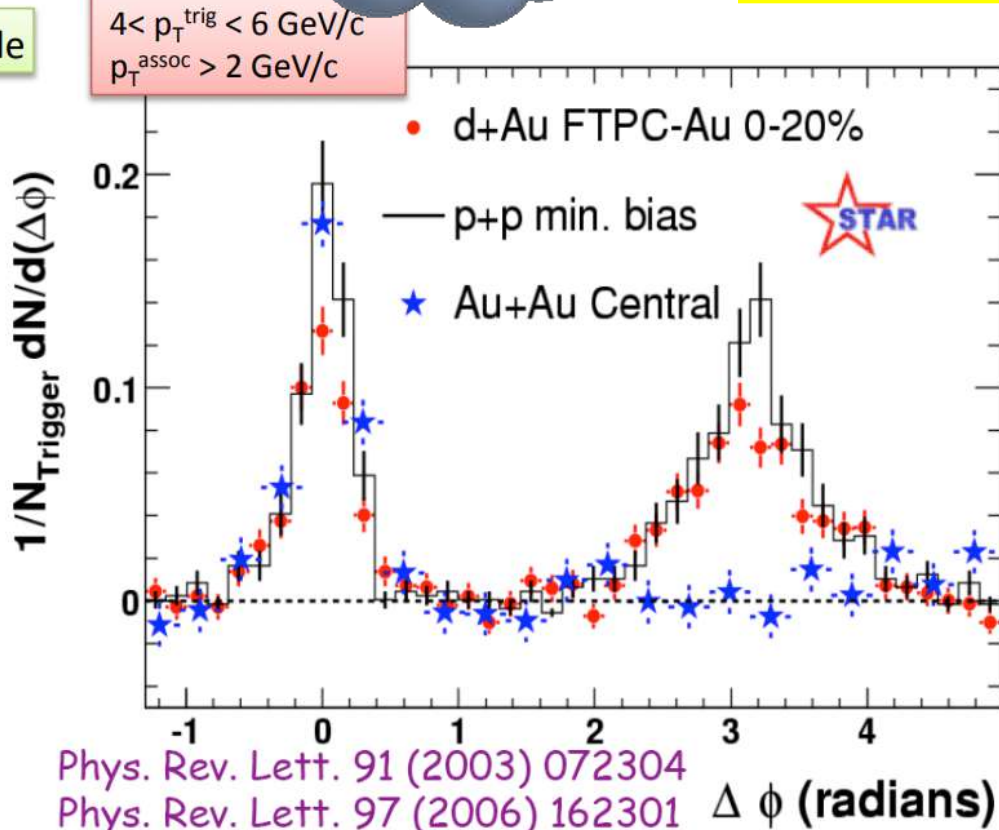
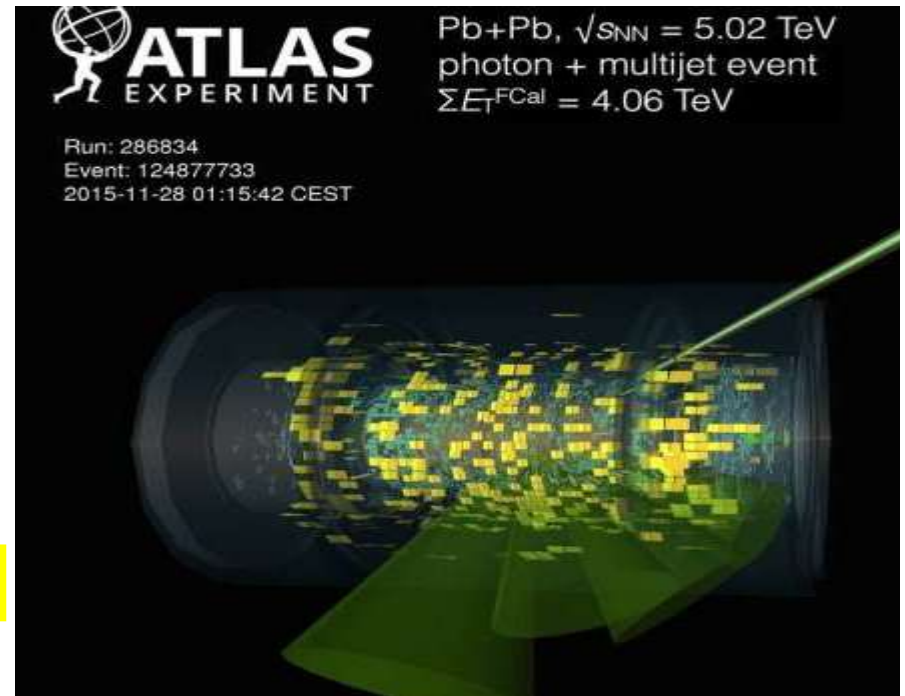
Propagation of γ/W thru nuclei

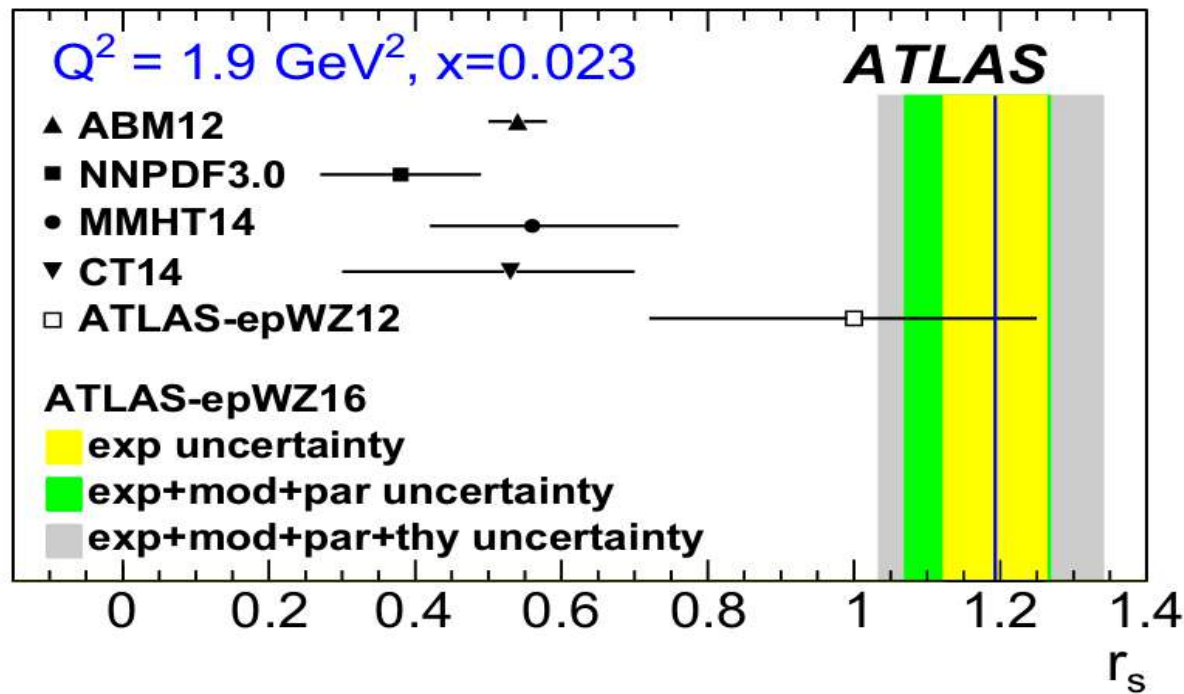
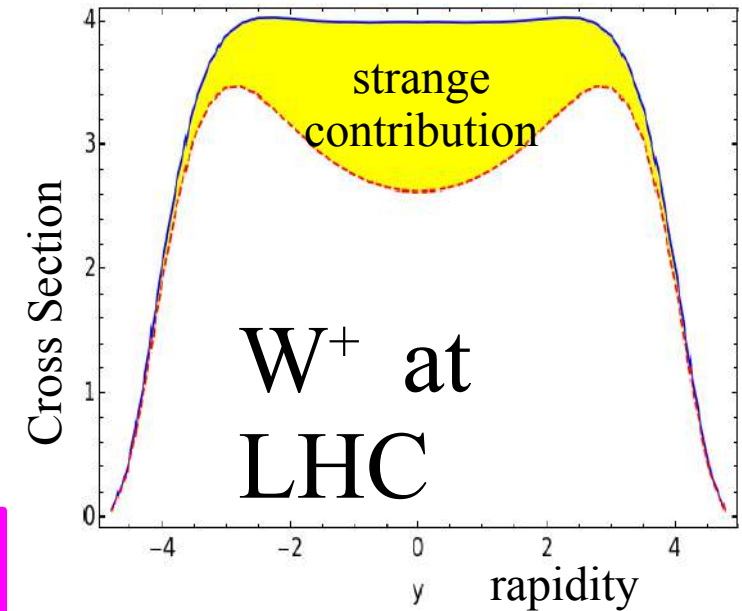
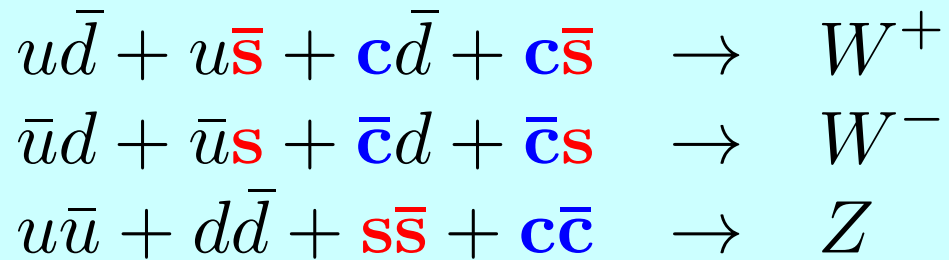
Neutrino DIS





Jet quenching

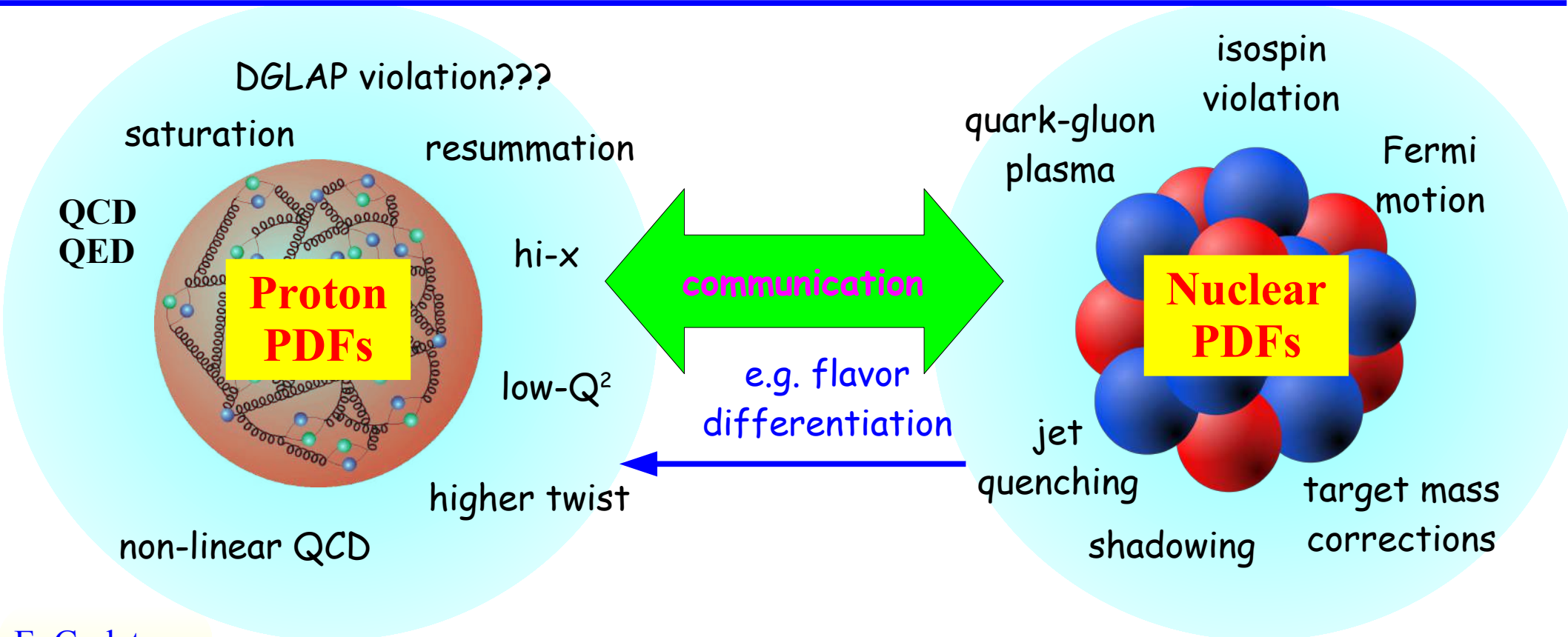




$$r^s = \frac{\bar{s} + s}{2\bar{d}}$$

Do it yourself!!!
Try xFitter

xFitter Tutorial



Data from nuclear targets play a key role in the flavor differentiation

nCTEQ

nuclear parton distribution functions

E. Godat
T.J. Hobbs
T. Jezo,
C. Keppel,
K. Kovarik
A Kusina,
F. Lyonnet,
J. Morfin,
F. Olness
J. Owens,
I. Schienbein,
J. Yu