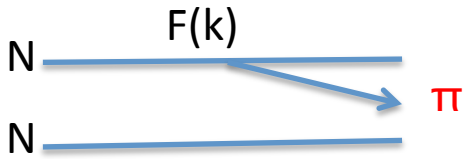
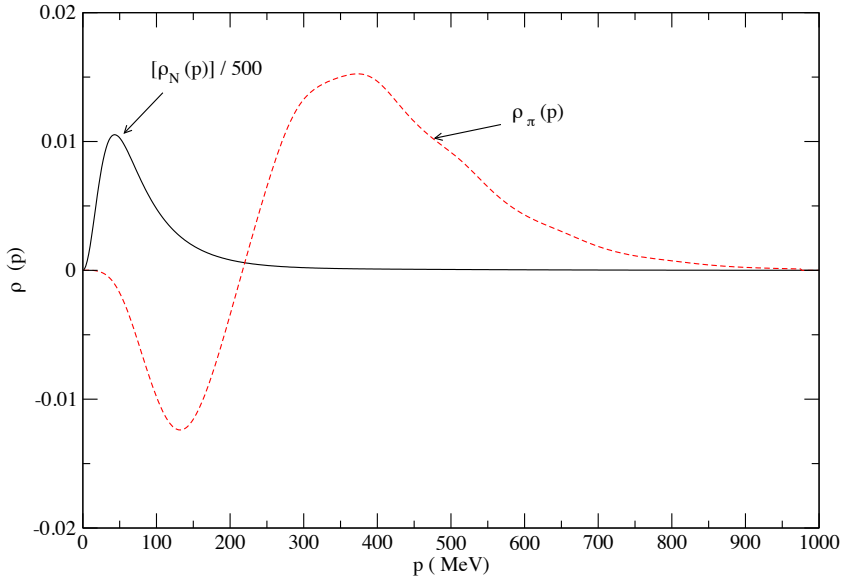
DIS and DY from pion field in nuclei

T.-S. Harry Lee
Argonne National Laboratory

Pions in Deuteron

$$\Psi_D = \phi_{NN} + \phi_{\pi NN}$$

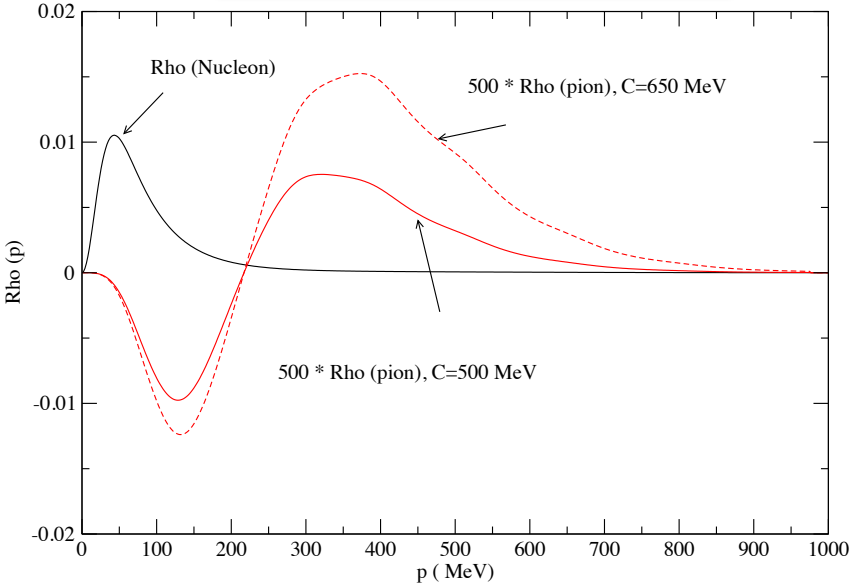




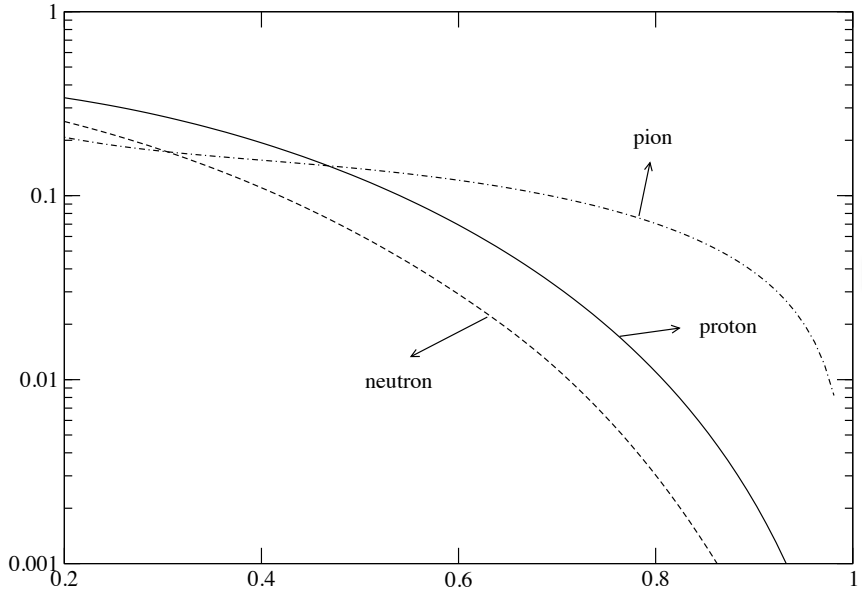
$$F(k)=g\,(k^2/(k^2+C^2)^2$$

Momentum distribution

Sensitive to range C

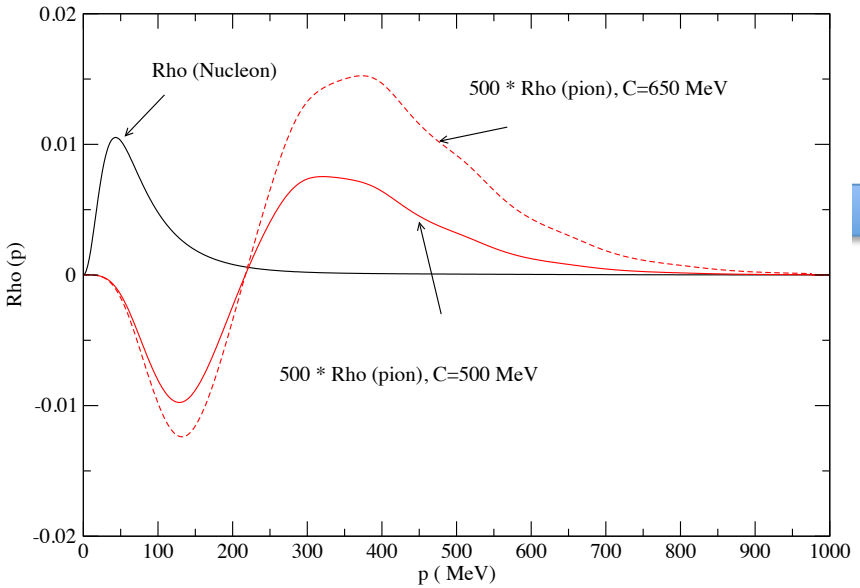


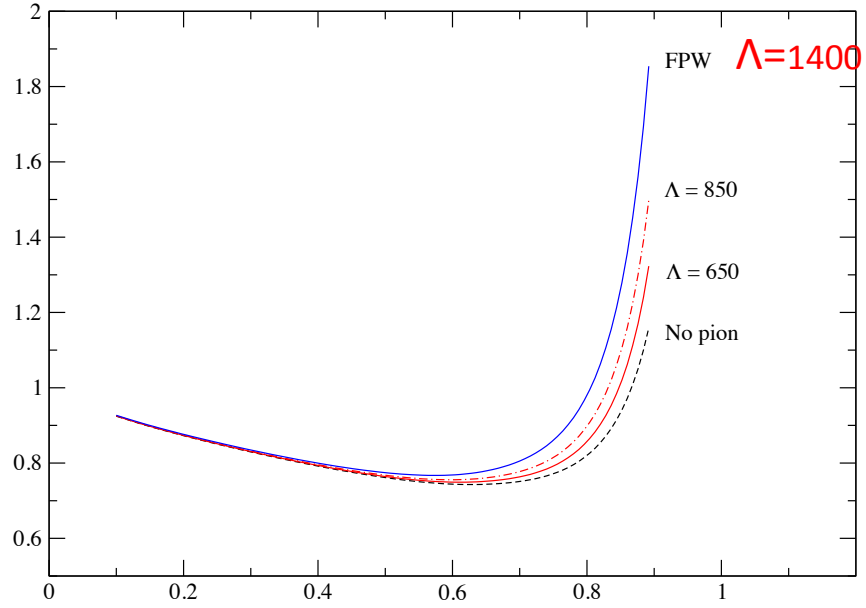
Structure functions



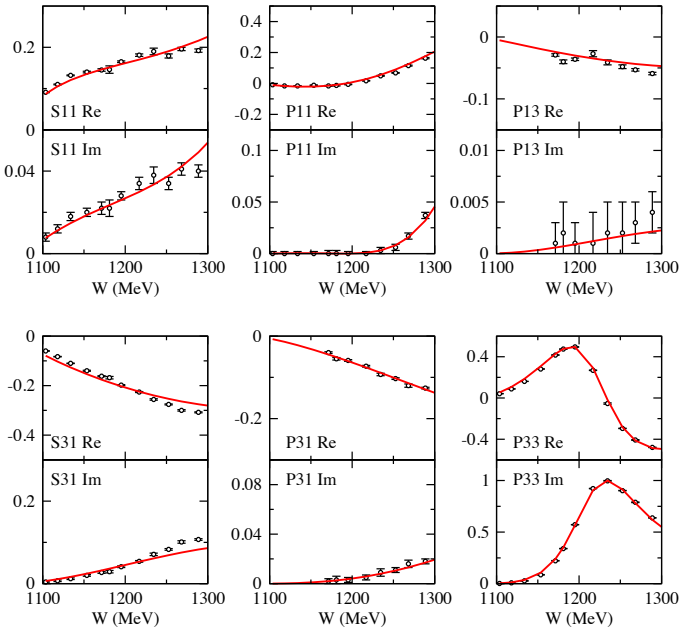
Pion effect is large at large x

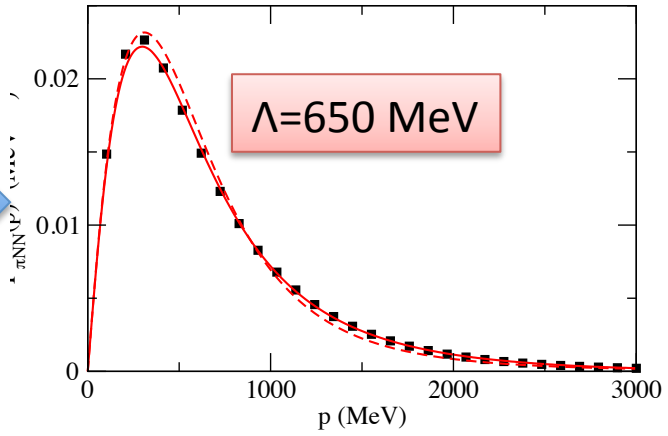
FIG. 1. Comparison of F_{2p}, F_{2n} and $F_{2\pi}$,



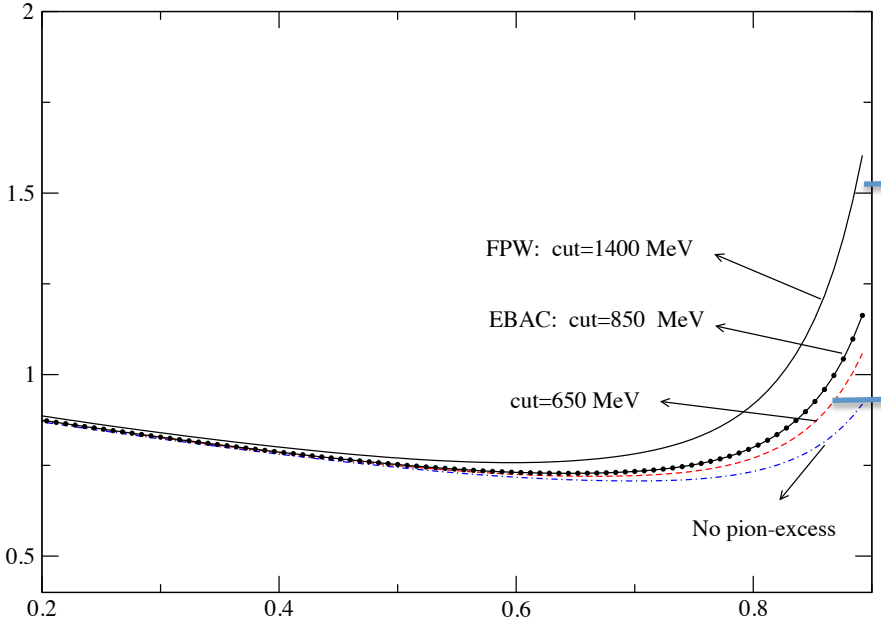


Fit to pi-N phase shifts (Kamano, Lee (KL), 2012)





$F_{\pi NN}(k) = g(\Lambda^2/(\Lambda^2 + k^2)^2$



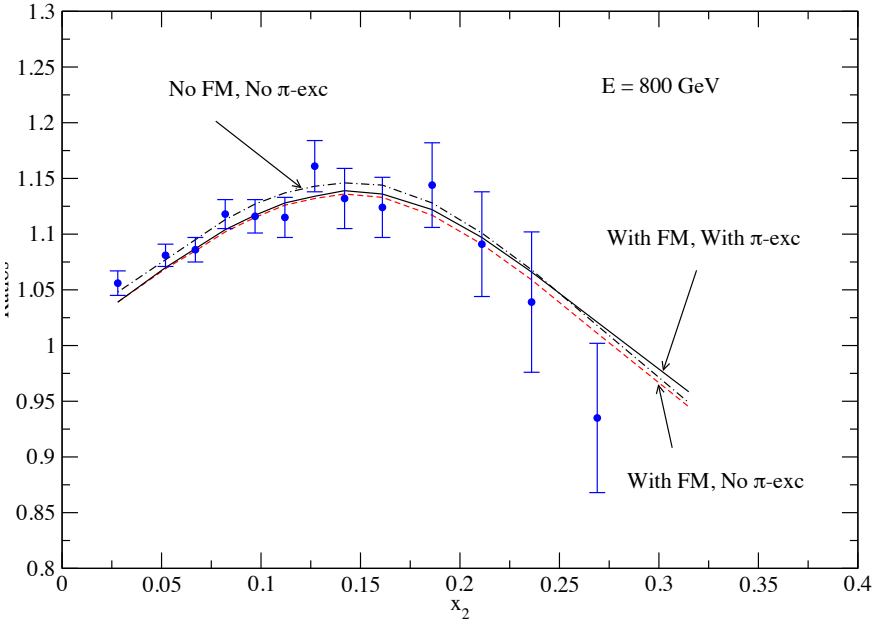
Friman, Pandharipande, Wiringa (1983)

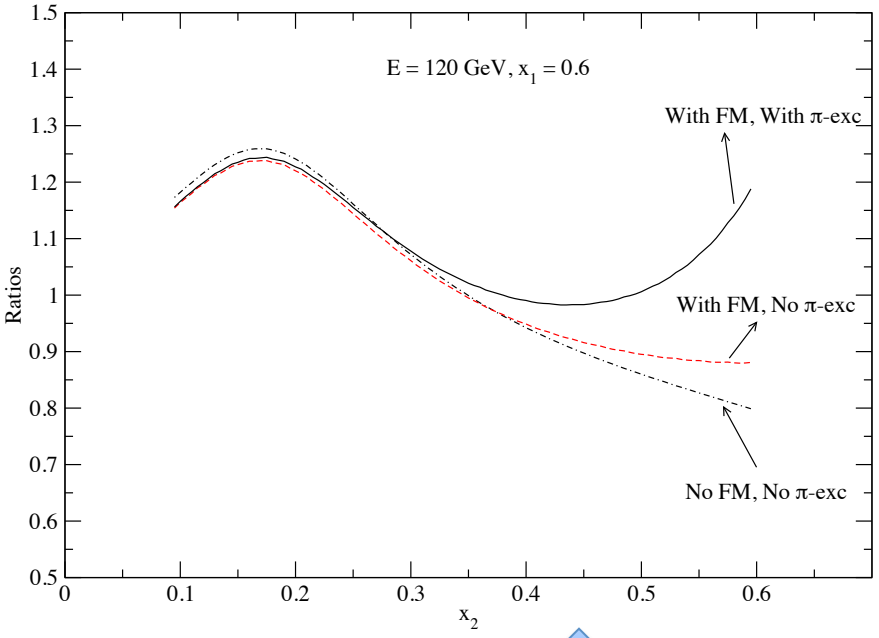
KL (2012)

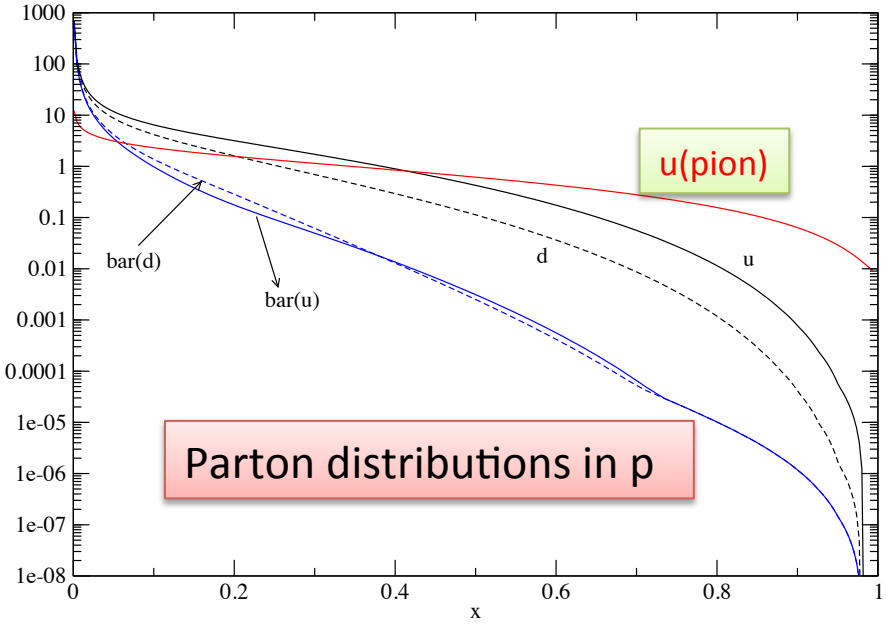
$\rho_\pi = - d V_{NN}(E_D)/dE_D$

Λ=1400 MeV

Pion effects on DY on deuteron







Parton distributions in p

Pion effect is large at large x

In progress : ^{3}He, ^{4}He