New Fit to e-A (^{12}C)Cross Sections (E. Christy and A. Bodek)

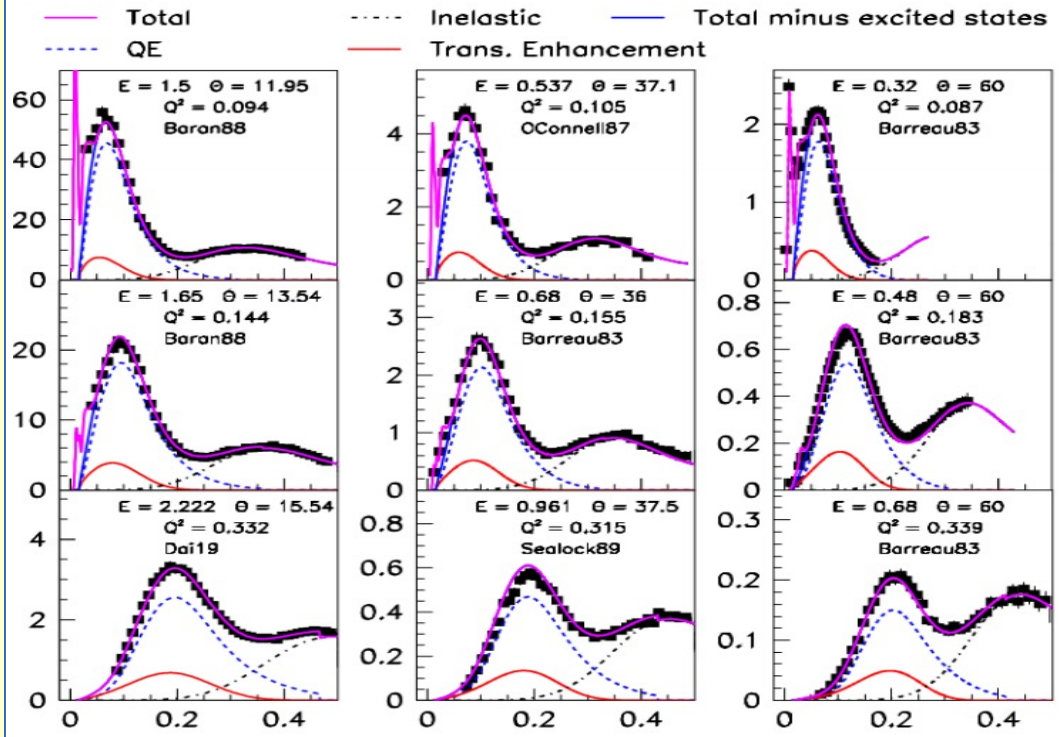
- New fit to world data with broad kinematic coverage encompassing entire QE, resonance, and DIS region.
- Can be used as proxy for data in tests of MC generators
- Used for performing radiative correction in electron scattering

  - $0 < Q^2 < 32$ (GeV/c)^2
  - $W^2 < 32$ GeV^2

Fit components: (^{12}C for now, other nuclei in process)

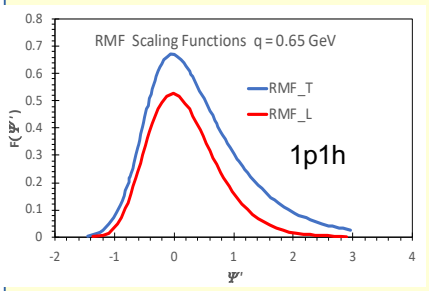
- Free nucleon cross sections taken from new fits to *e-p* and *e-d* data over same kinematic range.
- Superscaling (ψ') formalism for quasielastic with proton form factors taken from modern e-p fit and neutron form factors from e-d inclusive fit.
- Fermi smearing of free nucleon inelastic cross sections
- Parameterization of inelastic medium modifications at nucleon level prior to smearing (EMC effect) (different modifications for σ_T and σ_L)
- Transverse enhancement in QE region (both 1p1h and 2p2h)
- ψ'-scaling Pauli suppression.
- Extra suppression for σ_L at low Q^2.
- Nuclear excitation form factors (important at low Q)

Sample comparisons through Δ region.

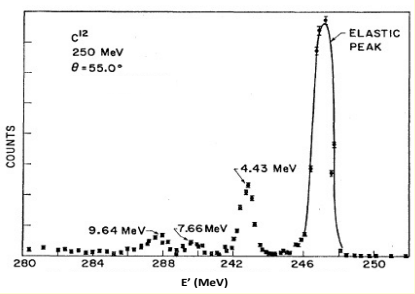


*** Fit represents good proxy for data**

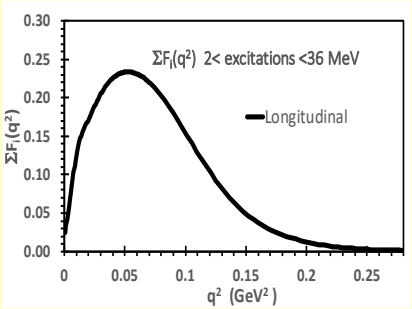
Important factors: 1p1h+2p2h transverse enhancement, and nuclear excitations.



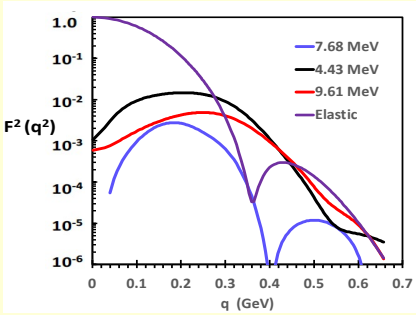
Transverse enhancement theoretically expected in 1p1h at QE peak. (in addition to 2p2h in dip between QE and Δ)



Nuclear excitation peaks



Nuclear excitations 22% of longitudinal QE cross section at $Q^2 = 0.06$ GeV^2



Comparison of fits to elastic and nuclear excitation form factors. Nuclear excitations bigger than nuclear elastic peak for q > 0.3 GeV