

# electron - proton scattering

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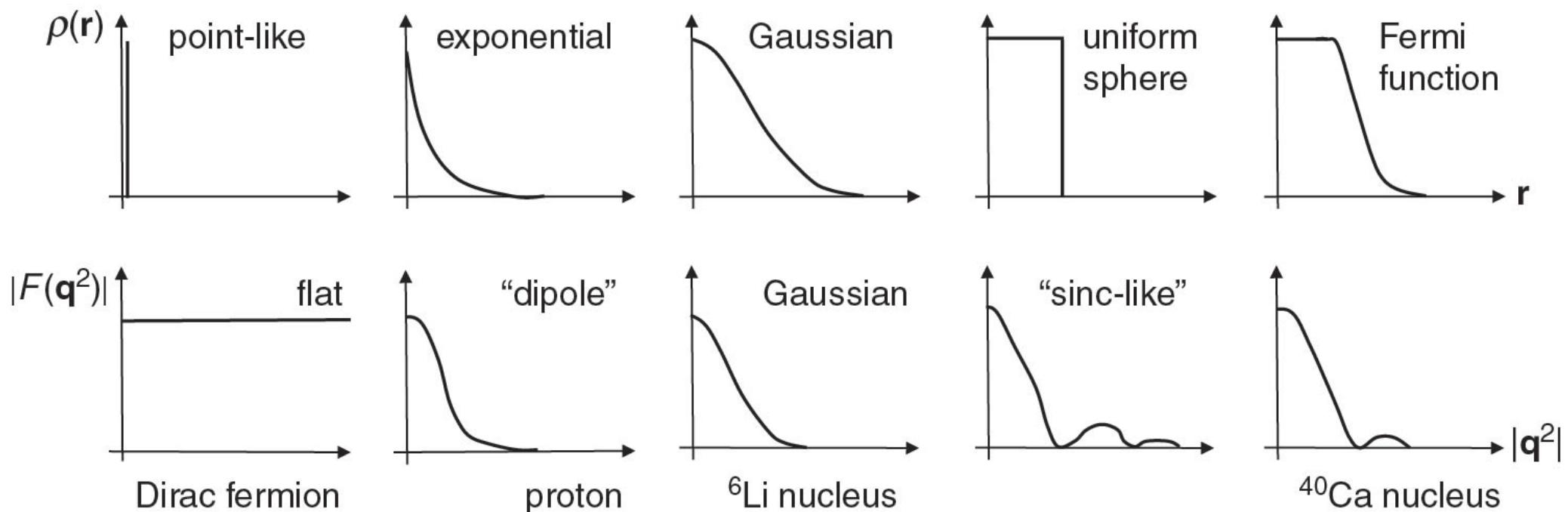
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Cluster of Excellence Precision Physics,  
Fundamental Interactions and Structure of Matter



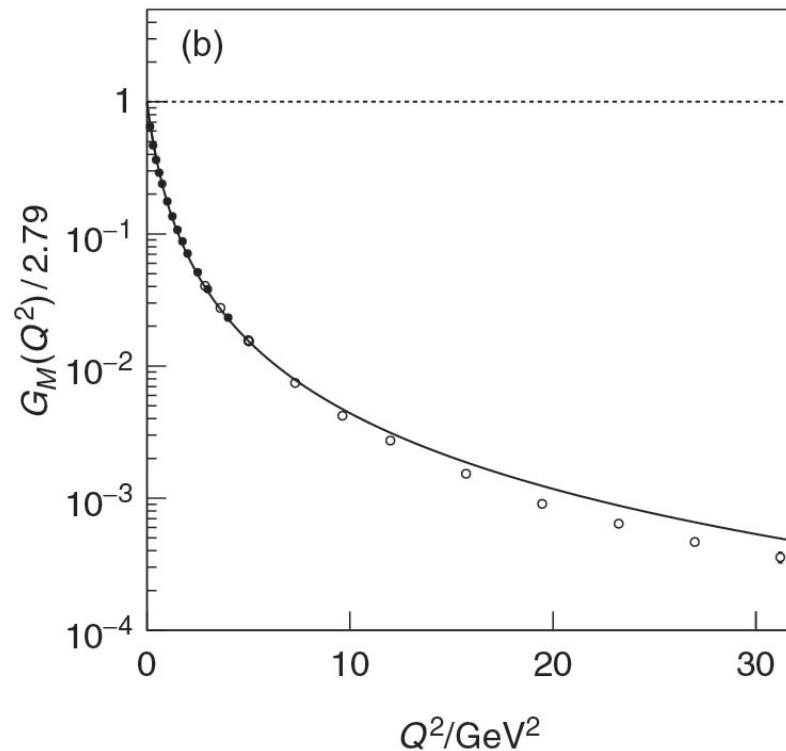
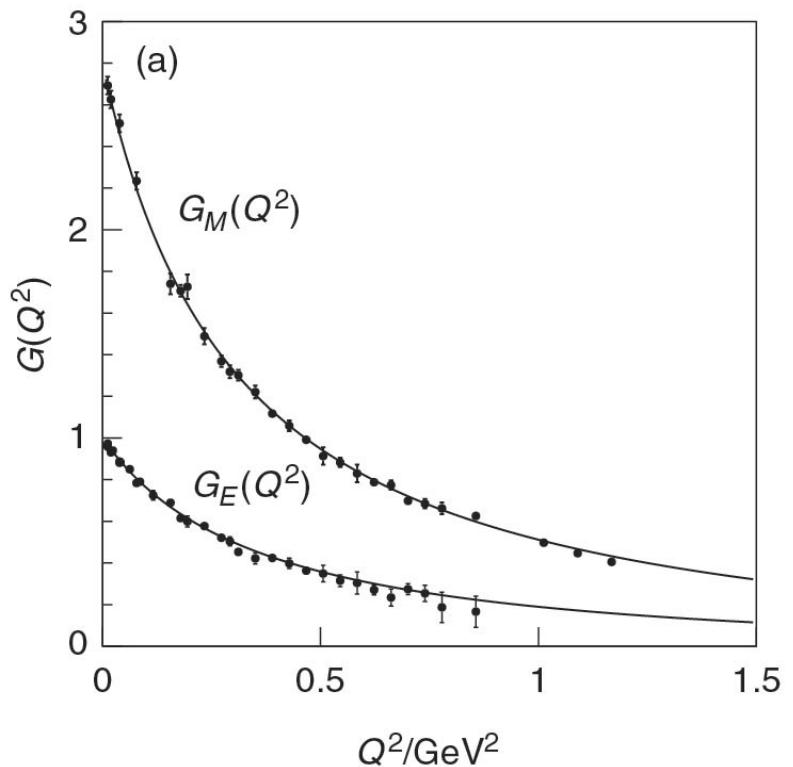
# Form factors



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# $G_E$ and $G_M$



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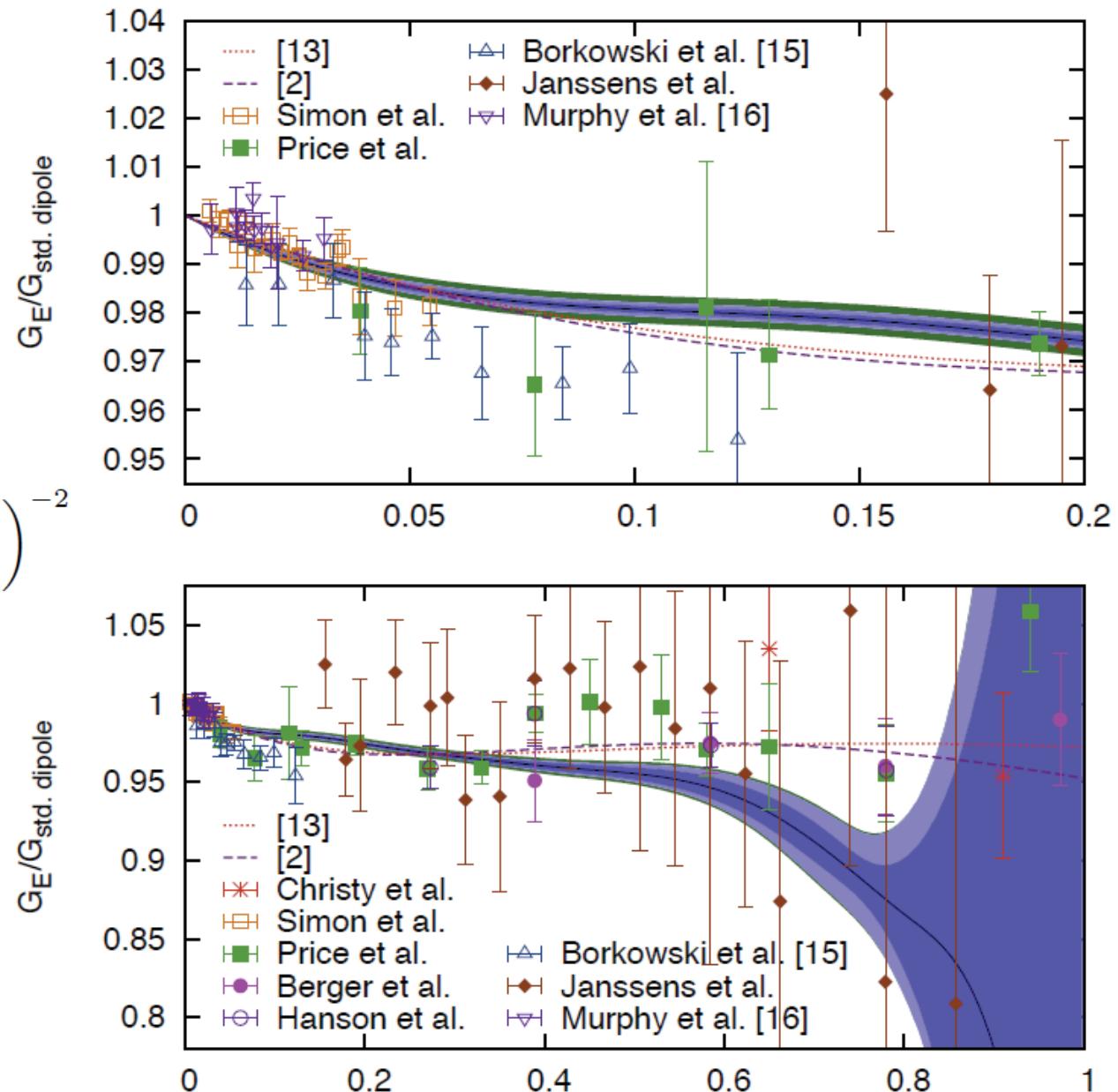




# Measuring proton form factors

$$G_E = \frac{G_M}{\mu_p} = G_{\text{std. dip.}} = \left(1 + \frac{Q^2}{0.71(\text{GeV}/c)^2}\right)^{-2}$$

J. Bernauer et al. [A1 Collaboration]  
Phys. Rev. Lett. 105 (2010) 242001

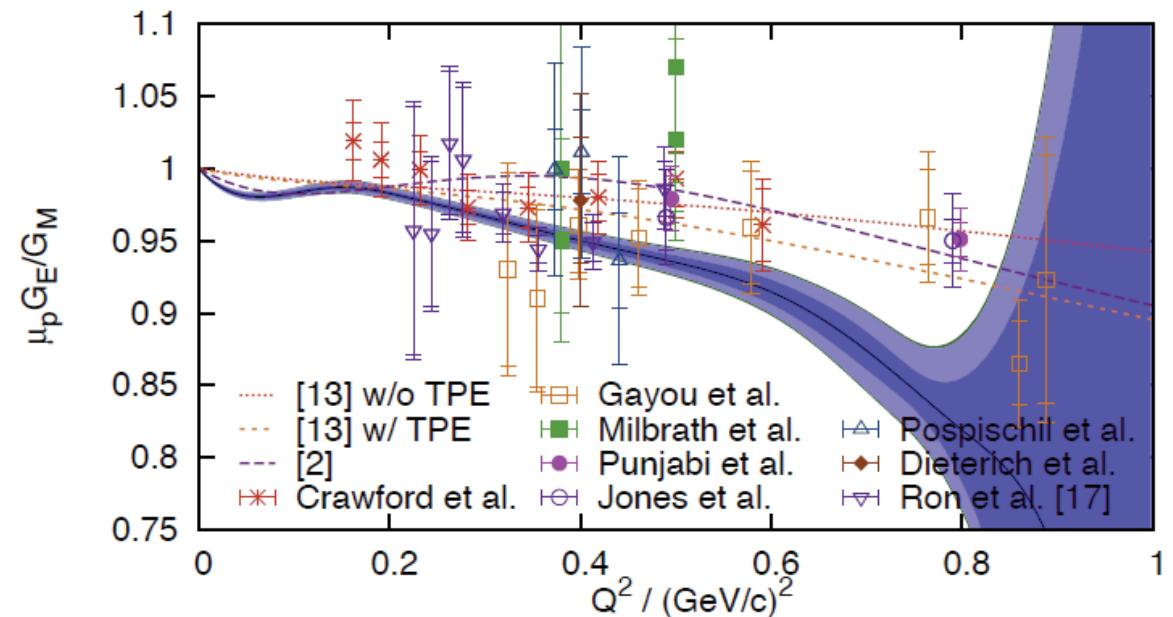
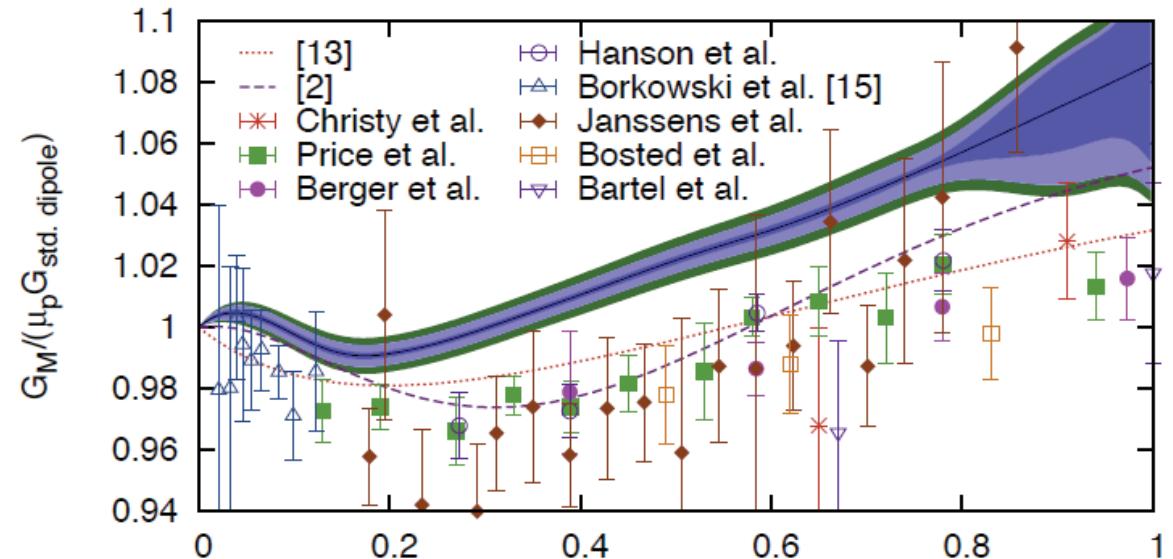




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# Inelastic ep scattering

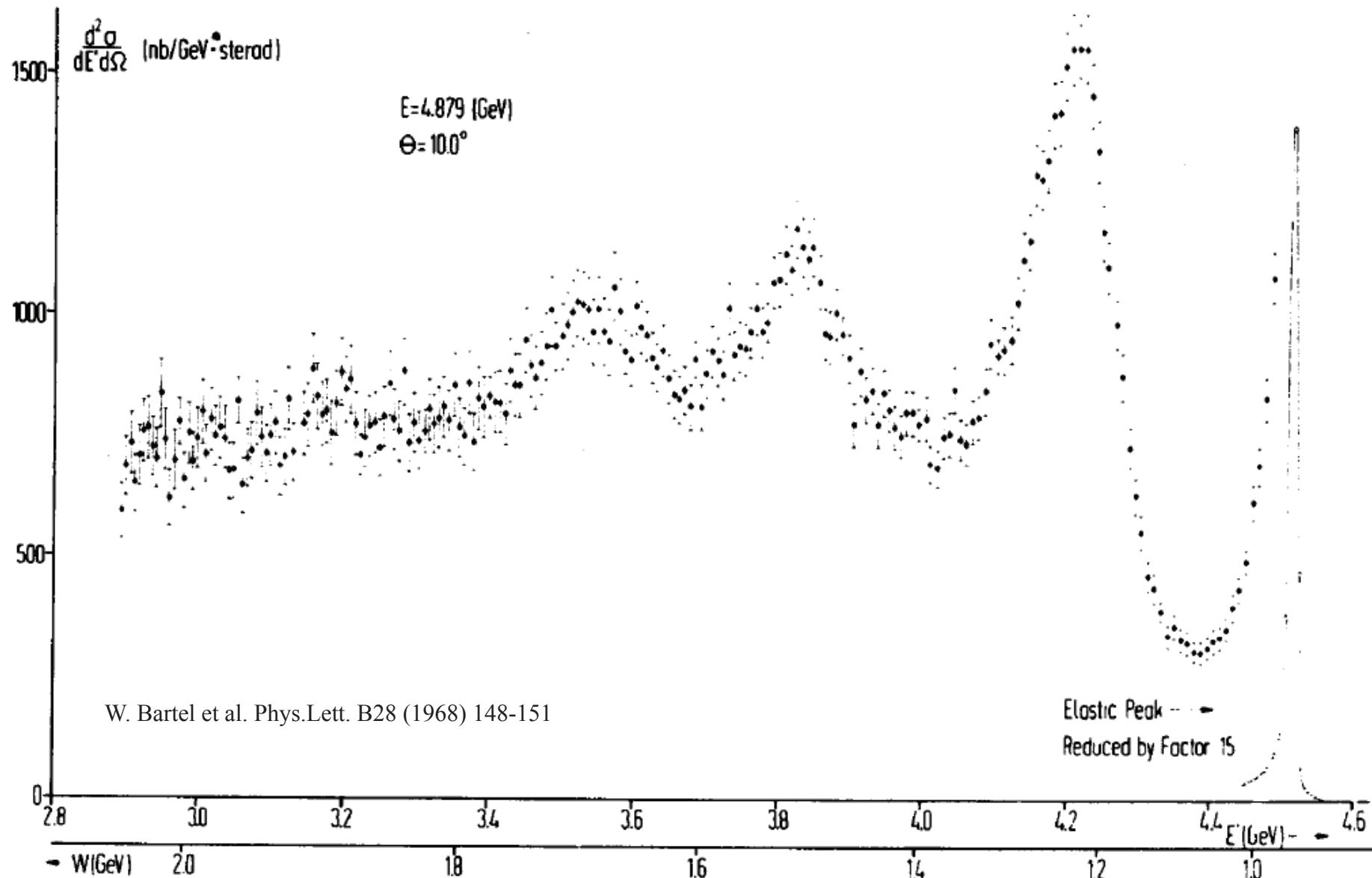
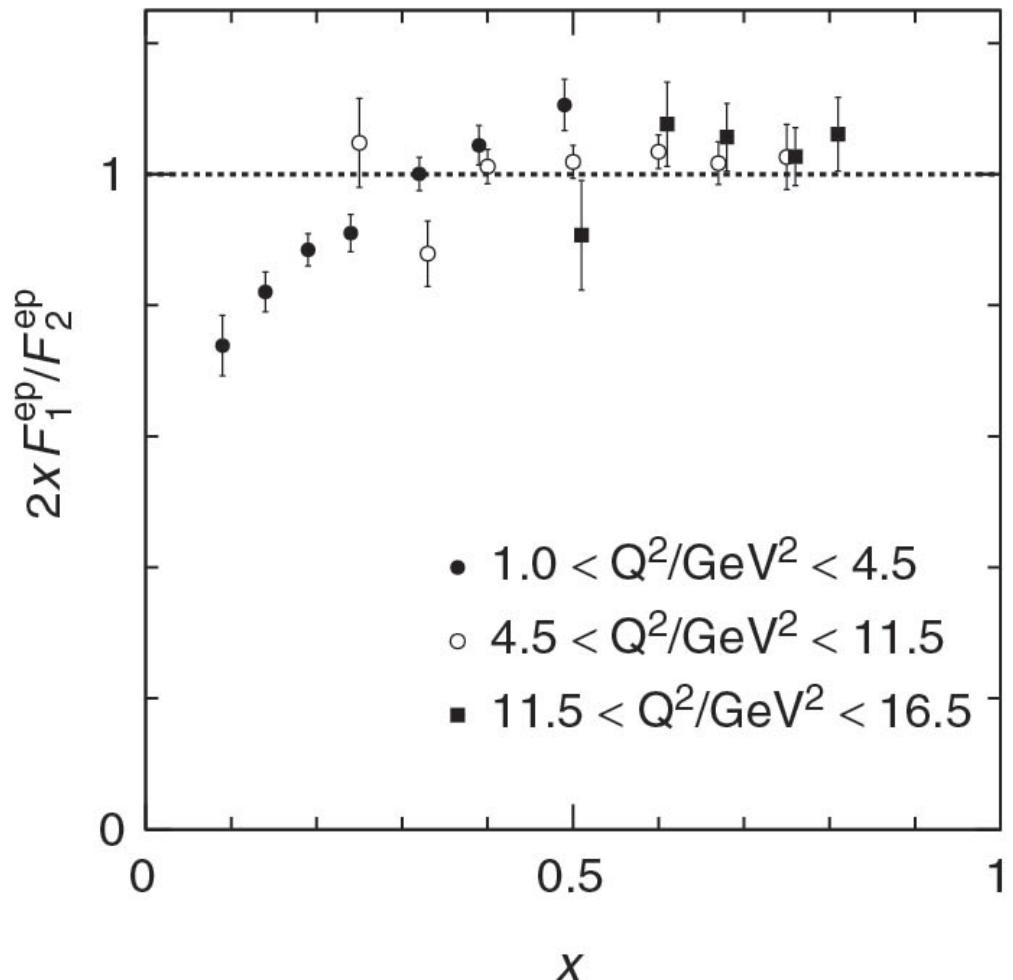
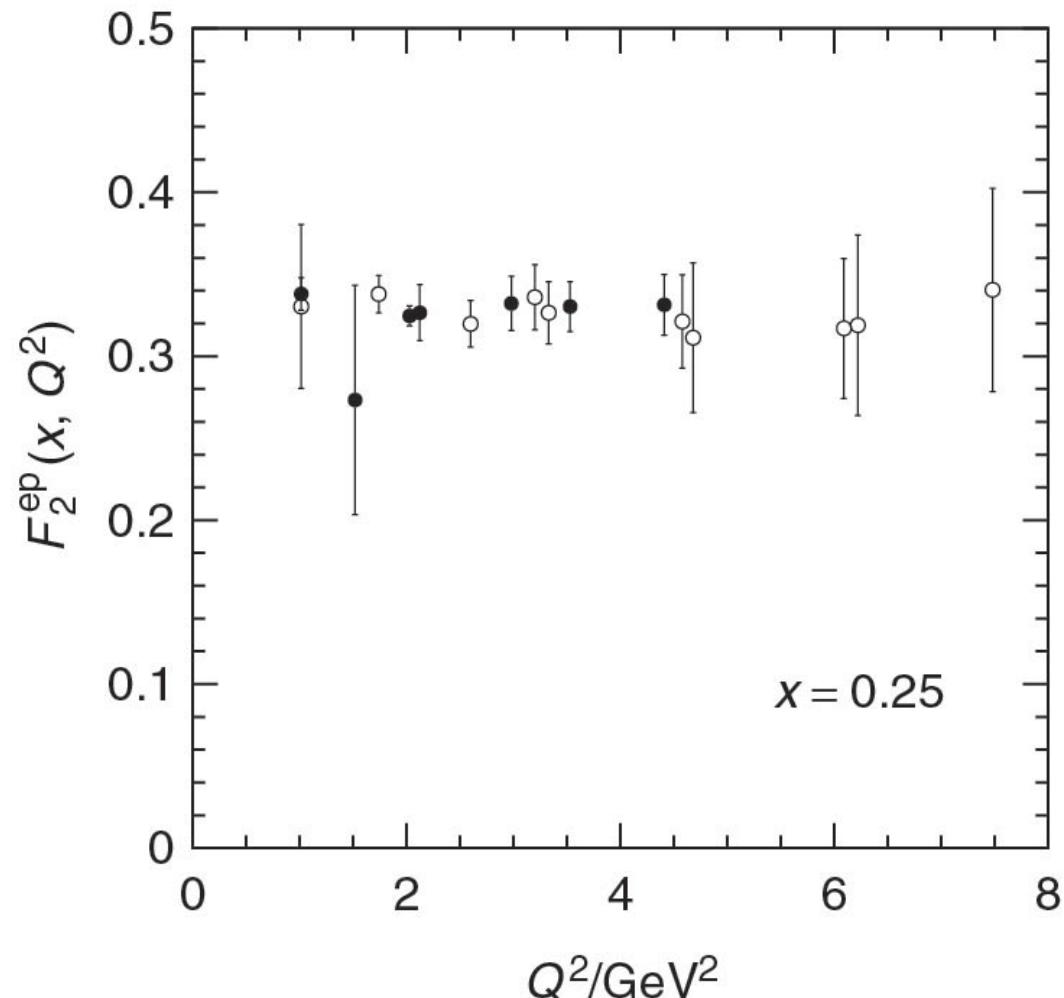


Fig. 1. Inelastic cross section before application of radiative corrections. The momentum transfer at the peak of the  $\Delta(1236)$  isobar was  $q^2 = 0.63$   $(\text{GeV}/c)^2$ .



# Bjorken scaling and Callan-Gross relation



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