E02-013: G_E^N at high Q^2 Experiment status

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For the E02-013 collaboration

Overview

- Form-factors
- E02-013 Experiment
- Measurement Technique
- Quasi-elastic Process Selection
- Background Subtraction
- Extracting Asymmetry
- Results

E02-013 Collaboration

- Spokespersons
  - Gordon Cates, University of Virginia
  - Nilanga Liyanage, University of Virginia
  - Bogdan Wojtsekhowsky, Jefferson Lab
- Post Docs and analysis coordinators
  - Robert Feuerbach, College of William and Mary
  - Seamus Riordan, Carnegie Mellon University (graduated 2008), University of Virginia
- Students
  - Sergey Abrahamyan, Yerevan Physics Institute
  - Brandon Craver, University of Virginia
  - Aidan Kelleher, College of William and Mary
  - Ameya Kolarkar, University of Kentucky (graduated 2007)
  - Jonathan Miller, University of Maryland

Form-Factors

- For point-like particles scattering cross-section is:

$$\left.\frac{d\sigma}{d\Omega}\right|_{point} = \left(\frac{d\sigma}{d\Omega}\right)_{Mott}\left(1+2\tau\tan^2\frac{\theta}{2}\right) \quad \text{where} \quad \left.\frac{d\sigma}{d\Omega}\right|_{Mott} = \left(\frac{\alpha\cos\frac{\theta}{2}}{2E\sin^2\frac{\theta}{2}}\right)^2\frac{E'}{E}$$

- For particles with structure in terms of Dirak and Pauli form factors

$$\frac{d\sigma}{d\Omega} = \left(\frac{d\sigma}{d\Omega}\right)_{Mott}\left[\left(F_1^2+\tau kF_2^2\right)+2\tau(F_1+kF_2)^2\tan^2\frac{\theta}{2}\right]$$

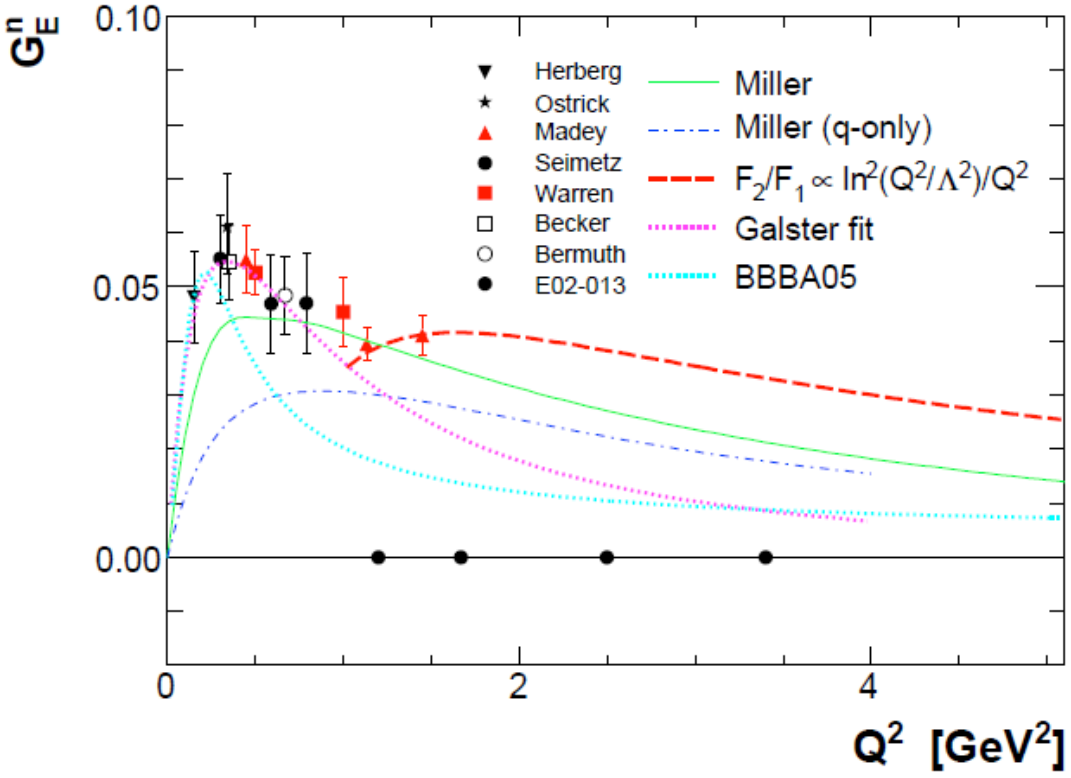
- In terms of Sachs form-factors

$$\frac{d\sigma}{d\Omega} = \left(\frac{d\sigma}{d\Omega}\right)_{Mott}\left[\frac{G_E^2+\tau G_M^2}{1+\tau}+2\tau G_M^2\tan^2\frac{\theta}{2}\right]$$

E02-013

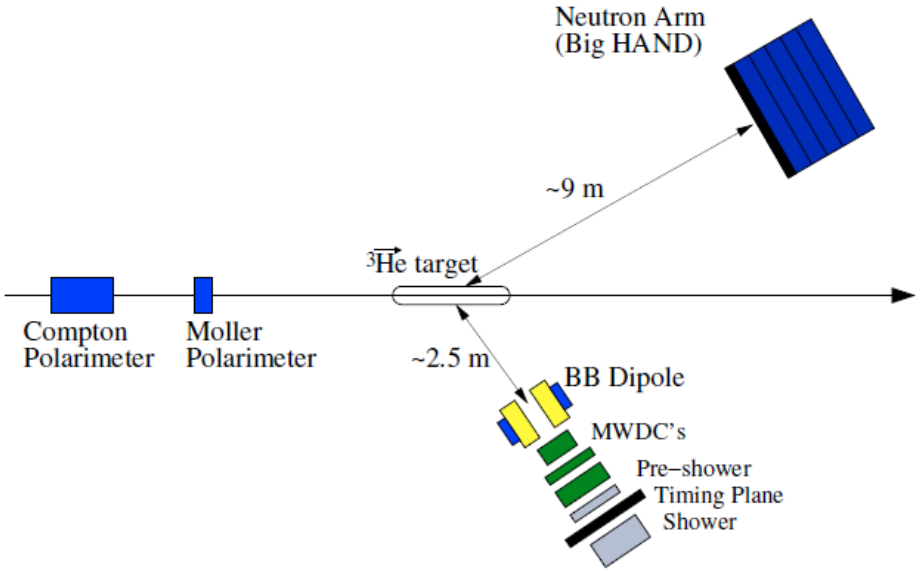
E02-013 were running from february-may 2006

Data for 4 kinematic points Q^2=1.2, 1.7, 2.5,3.5 GeV^2



Experimental Setup

- Neutron Arm
  - 7 scintillator planes for hadron detection
  - 2 veto-detector planes for charge identification
- BigBite
  - Dipole Magnet (1.2 T)
  - 15 MWDC planes
  - scintillators plane
  - 2-array Electromagnetic Calorimeter
- Polarized ^{3}He Target



Measurement Technique