

**Measurement of the Spin Structure Function of the Neutron  $G_1(N)$  from Deep Inelastic Scattering of Polarized Electrons from Polarized Neutrons in He-3<sup>\*</sup>**

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MEASUREMENT OF THE SPIN STRUCTURE FUNCTION OF THE NEUTRON  $g_1^n$   
FROM DEEP INELASTIC SCATTERING OF POLARIZED ELECTRONS FROM  
POLARIZED NEUTRONS IN  $^3\text{He}$

by

James A. Dunne

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of

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in

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ABSTRACT

Polarized electrons of energies 19.42, 22.67, and 25.5 GeV were scattered off a polarized  $^3\text{He}$  target at SLAC's End Station A to measure the spin asymmetry of the neutron. From this asymmetry, the spin dependent structure function  $g_1^n(x)$  was determined over a range in  $x$  from 0.03 to 0.6 with an average  $Q^2$  of  $2 (\text{GeV}/c)^2$ . The value of the integral of  $g_1^n$  over  $x$  is  $\int_0^1 g_1^n(x) dx = -0.036 \pm 0.009$ . The results were interpreted in the frame work of the Quark Parton Model (QPM) and used to test the Ellis-Jaffe and Bjorken sum rules. The value of the integral is 2.6 standard deviations from the Ellis-Jaffe prediction while the Bjorken sum rule was found to be in agreement with this data and proton data from SMC and E-143.

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## TABLE OF CONTENTS

ABSTRACT .....	ii
ACKNOWLEDGMENTS .....	iii
LIST OF TABLES .....	x
LIST OF ILLUSTRATIONS .....	xiii
CHAPTER I: INTRODUCTION .....	1
Structure Functions .....	2
Unpolarized Structure functions .....	2
Polarized Structure Functions .....	7
Asymmetries .....	11
Lepton-Nucleon Asymmetry .....	11
Virtual Photon-Nucleon Asymmetry .....	11
Quark Parton Model .....	12
Sum Rules .....	17
Björken Sum Rule .....	17
The Ellis-Jaffe Sum Rules .....	19
The Burkhart-Cottingham Sum Rule .....	20
Motivation .....	21

CHAPTER 2. EXPERIMENTAL SETUP	25
Beam transport and monitoring	25
The Polarized Target	36
Spectrometers	41
Detectors	44
Čerenkov	44
Shower Counter	45
Hodoscope	48
Trigger Electronics	52
Shower Signals	53
Čerenkov Signals	55
Hodoscope Signals	56
Lucite Signals	56
Main Trigger	57
Efficiency Triggers	58
Trigger OR	60
Hodogate	61
Beam Gate	61
Data Acquisition	62
The Run Plan	64

<b>CHAPTER 3: DATA ANALYSIS</b> .....	65
<b>Shower Analysis</b> .....	65
<b>Clustering Algorithm</b> .....	65
<b>Shower Calibration</b> .....	66
<b>Shower Cuts</b> .....	70
<b>Ghost Cut</b> .....	70
<b>Dead Block Cut</b> .....	71
<b>Overlap cut</b> .....	71
<b>Neural Network Cut</b> .....	72
<b>Efficiency</b> .....	73
<b>Beam Analysis</b> .....	76
<b>Beam cuts</b> .....	76
<b>Beam Polarization Cuts</b> .....	77
<b>Beam Polarization measurement</b> .....	79
<b>Tracking Analysis</b> .....	81
<b>Tracking Algorithm</b> .....	81
<b>Efficiency</b> .....	83
<b>Cerenkov Analysis</b> .....	85
<b>Target Polarization</b> .....	86
<b>Event Selection</b> .....	87
<b>Main Cut Definition</b> .....	88
<b>Binning</b> .....	88



Pion Analysis .....	88
Positron Analysis .....	92
Dead-time Correction .....	95
Radiative Corrections .....	99
Internal Corrections .....	100
External Radiative Corrections .....	104
Models .....	107
Dilution Factor .....	110
Method I .....	111
Method II .....	113
$f_2$ Term .....	115
Resolution Correction .....	116
<b>CHAPTER 4: RESULTS AND CONCLUSIONS</b> .....	<b>119</b>
Systematic Uncertainties .....	119
False Asymmetries .....	124
Raw Asymmetries .....	126
Electron-nucleon asymmetries: $A_{  }$ and $A_{\perp}$ .....	127
The longitudinal and transverse electron-nucleon asymmetries of the neutron .....	134
The virtual photon- $^3\text{He}$ asymmetries: $A_1^{^3\text{He}}$ and $A_2^{^3\text{He}}$ .....	140
The virtual photon-neutron asymmetries: $A_1^n$ and $A_2^n$ .....	143
$Q^2$ dependence of $A_1^n$ and $g_1/F_1$ .....	147
The $g_1^n$ structure function .....	153

Extrapolations	159
Low $x$ extrapolation	159
High $x$ extrapolation	161
Summary of $g_1^n$ Results	164
Implications	164
Bjorken sum rule comparison with E-143	167
Bjorken sum rule comparison with SMC	168
Conclusion	169
APPENDIX A	171
Introduction	171
New Analysis	172
New Corrections and Factors	175
Comparison of <i>Fall94</i> and <i>Quick</i> Analysis	181
Low $x$ point	185
Options	187
APPENDIX B	207
Resonance Region Asymmetries	207
REFERENCES	210

## LIST OF TABLES

1.	Forward Compton Helicity Amplitudes	9
2.	E-142 Target Cells	39
3.	Hodoscope Information	49
4.	Beam Cuts	77
5.	Pion Asymmetries: $A^{\pi} = A_{\text{raw}} / (\text{Pol}_{\text{beam}} \cdot \text{Pol}_{\text{target}} \cdot f_1)$	90
6.	Ratio of $e^+$ to $e^-$ for all energies and both spectrometers	93
7.	Average Additive Dead-time Correction	98
8.	Target Model for External Radiative Corrections	105
9.	Estimation of Systematic Error on Total Additive Radiative Correction	108
10.	$f_1$ Term of the Dilution Factor (Method I)	113
11.	$f_1$ Term (Method II)	115
12.	Bin boundaries for the eight $x$ bins	129
13.	$A_{\parallel}^{3\text{He}}$ for all energies and spectrometers	130
14.	$A_{\perp}^{3\text{He}}$ for all energies and spectrometers	132
15.	$A_{\parallel}^n$ for all energies and spectrometers	136
16.	$A_{\perp}^n$ for all energies and spectrometers	138
17.	$A_1^{3\text{He}}$ versus $x$	140
18.	$A_2^{3\text{He}}$ versus $x$	142

19.	$A_2^n$ versus $x$	144
20.	Systematic error on $A_1^n$ determined from $A_{  }$ and $A_{\perp}$	145
21.	$A_1^n$ and $g_1/F_1$ versus $x$	146
22.	Bjorken $x$ range for each data set	148
23.	$A_1^n$ versus $Q^2$	149
24.	$g_1/F_1$ versus $Q^2$	151
25.	$g_1^n(x, Q^2)$ versus $x$ at the measured $Q^2$ determined from $A_{  }$ and $A_{\perp}$	153
26.	Systematic error on $g_1^n$ determined from $A_1^n$ and $g_2^{ww}$ at $Q^2 = 2 \text{ (GeV/c)}^2$	155
27.	$g_1^n$ evaluated from $A_1^n$ and $g_2^{ww}$ at $Q^2 = \{2, 3 \text{ and } 10 \text{ (GeV/c)}^2\}$	156
28.	Value of the integral of $g_1^n$ in the measured region (from $A_1^n$ and $g_2^{ww}$ )	156
29.	$g_1^n$ evaluated from $g_1/F_1$ at $Q^2 = \{2, 3, \text{ and } 10 \text{ (GeV/c)}^2\}$	157
30.	Value of the integral of $g_1^n$ in the measured region (from $g_1/F_1$ )	157
31.	Low $x$ integral of $g_1^n(A_1^n, g_2^{ww})$	161
32.	High $x$ extrapolation using $A_1^n = 0.75 \pm 0.25$ as $x \rightarrow 1$	162
33.	High $x$ extrapolation with final error determination	163
34.	Latest published results of recent spin structure experiments	165
35.	Summary of E-142 results	169
36.	Beam Cuts	175
37.	Target Model for External Radiative Corrections	176
38.	Comparison of cut 18 with cuts which affect the event selection/statistics	183
39.	Comparison of cut 18 and cut 48 with the new correction factors	184
40.	Information on Low $x$ point ( $x=[0.03-0.04]$ ) for various cuts	186

41. Options for final results of <i>Fall94</i> analysis	188
42. PRL and Cut 18 w/ Quick Corr. Factors	189
43. Same as previous w/ just 2/2	190
44. Same as previous w/ <i>Cell</i> Clustering	190
45. Same as previous w/ new Beam Cuts ( <i>Spring94</i> )	191
46. Same as previous w/ Neural cut	191
47. Same as previous w/ Ghost cut	192
48. Same as previous w/ new Beam and target polarizations	192
49. Same as previous w/ new Radiative Corrections	193
50. Same as previous w/ new Dilution factor	193
51. Same as previous w/ new dead time	194
52. Same as previous w/ E-143 proton correction	194
53. Same as previous w/ new contamination correction	196
54. Cut 48 with all new factors and all data (recovered runs)	196
55. Cut 48 with and without resolution correction	197
56. Cut 46 with and without resolution correction	198
57. Combinations of Cuts used in Analysis	203

## LIST OF ILLUSTRATIONS

<b>Figure 1</b> Feynman diagram for deep inelastic e-N scattering	1
<b>Figure 2</b> Early data on $F_2$ versus $Q^2$ for $x = 0.25$	6
<b>Figure 3</b> $F_2$ scaling violation	7
<b>Figure 4</b> $A_1^p$ for SLAC and EMC experiments	22
<b>Figure 5</b> A-Bend beam line at SLAC	26
<b>Figure 6</b> Elements of the A-Line in ESA	28
<b>Figure 7</b> Polarization precession angle versus beam energy	31
<b>Figure 8</b> Polarized Light Source for E-142	31
<b>Figure 9</b> Band Structure for AlGaAs	33
<b>Figure 10</b> Schematic of Photocathode	34
<b>Figure 11</b> Top view of Møller polarimeter setup	36
<b>Figure 12</b> $^3\text{He}$ in S state	37
<b>Figure 13</b> E-142 target setup. (Only one of five Ti Sapphire lasers shown)	38
<b>Figure 14</b> E-142 Target Cell	38
<b>Figure 15</b> E-142 Spectrometers	41
<b>Figure 16</b> "S" Bend configuration of magnets	42
<b>Figure 17</b> Solid angle versus momentum	42
<b>Figure 18</b> Ray traces for the 4.5° and 7° spectrometers	43

<b>Figure 19</b> Detectors (Top View, not to scale)	44
<b>Figure 20</b> Čerenkov detector	45
<b>Figure 21</b> Shower counter	47
<b>Figure 22</b> Lead glass block	48
<b>Figure 23</b> Hodoscope fingers (2/3 overlap)	50
<b>Figure 24</b> Lucite planes	51
<b>Figure 25</b> Trigger schematic legend	53
<b>Figure 26</b> Saclay splitter	54*
<b>Figure 27</b> Shower counter schematic	55
<b>Figure 28</b> Čerenkov trigger schematic	56
<b>Figure 29</b> Lucite coincidence and Pion trigger	57
<b>Figure 30</b> Main trigger	58
<b>Figure 31</b> Efficiency triggers	59
<b>Figure 32</b> Trigger OR and the Saclay Trigger Divider	60
<b>Figure 33</b> Hodogate	61
<b>Figure 34</b> Beam Gate schematic	62
<b>Figure 35</b> Data Acquisition schematic	63
<b>Figure 36</b> Cluster block numbering around central block	67
<b>Figure 37</b> Fractional energy distribution in a non-edge cluster	69
<b>Figure 38</b> Neural network output for pions and electrons	73
<b>Figure 39</b> Neural network (NN 0.95) effect on E/P	73
<b>Figure 40</b> Neural Network efficiency versus energy for the 4.5° at 19 GeV	74

<b>Figure 41</b> Neural Network efficiency versus energy for the 7° at 19 GeV	74
<b>Figure 42</b> Neural Network efficiency versus energy for the 4.5° at 22 GeV	75
<b>Figure 43</b> Neural Network efficiency versus energy for the 7° at 22 GeV	75
<b>Figure 44</b> Neural Network efficiency versus energy for the 4.5° at 25 GeV	75
<b>Figure 45</b> Neural Network efficiency versus energy for the 7° at 25 GeV	75
<b>Figure 46</b> Neural Network efficiency versus Trigger OR rate for the 4.5° at 22 GeV	76
<b>Figure 47</b> Neural Network efficiency versus Trigger OR rate for the 7° at 22 GeV	76
<b>Figure 48</b> Gate widths where polarization bits are valid	78
<b>Figure 49</b> 4.5° Trigger OR distribution for 2/2 case and 2/2 but not 3/3	79
<b>Figure 50</b> 7° Trigger OR distribution for 2/2 case and 2/2 but not 3/3	79
<b>Figure 51</b> Measured Møller asymmetry and background	80
<b>Figure 52</b> Beam polarization versus run number	81
<b>Figure 53</b> Tracking algorithm flow chart	83
<b>Figure 54</b> 4.5° tracking efficiency versus E'	84
<b>Figure 55</b> 7° tracking efficiency versus E'	84
<b>Figure 56</b> 4.5° tracking efficiency versus Trigger Or Rate	85
<b>Figure 57</b> 7° tracking efficiency versus Trigger Or Rate	85
<b>Figure 58</b> ADC spectra for channels > 25 from the Čerenkov detectors	86
<b>Figure 59</b> <sup>3</sup> He and water NMR signals for the polarization measurement	87
<b>Figure 60</b> Pion asymmetries $A^\pi = A_{\text{raw}} / (Pol_{\text{beam}} Pol_{\text{target}} f_1)$	91
<b>Figure 61</b> Ratio of e <sup>+</sup> to e <sup>-</sup> for all energies in each spectrometer as a function of x	94
<b>Figure 62</b> Measured trigger OR dead-time	98



<b>Figure 63</b> Feynman diagrams of higher order radiative processes	100
<b>Figure 64</b> Additive Internal Radiative Correction to $A_{\parallel}^{3\text{He}}$ for the $4.5^\circ$ spectrometer	103
<b>Figure 65</b> Additive Internal Radiative Correction to $A_{\parallel}^{3\text{He}}$ for the $7^\circ$ spectrometer	103
<b>Figure 66</b> Elastic and quasi-elastic radiative tail contribution to $A_{\parallel}^{3\text{He}}$ for the $4.5^\circ$	103
<b>Figure 67</b> Elastic and quasi-elastic radiative tail contribution to $A_{\parallel}^{3\text{He}}$ for the $7^\circ$	103
<b>Figure 68</b> Schematic of $^3\text{He}$ target with NMR pickup coils (not to scale)	106
<b>Figure 69</b> Additive Internal + External Radiative Correction to $A_{\parallel}^{3\text{He}}$ for the $4.5^\circ$ )	106
<b>Figure 70</b> Additive Internal + External Radiative Correction to $A_{\parallel}^{3\text{He}}$ for the $7^\circ$	106
<b>Figure 71</b> Smearing of the momentum spectrum	117
<b>Figure 72</b> Resolution corrections for $4.5^\circ$ and $7^\circ$ data versus $E'$	118
<b>Figure 73</b> Comparison of $F_2$ from the F2NMC parameterization versus data	123
<b>Figure 74</b> $A_2^n$ averaged over $E'$ and $\theta$ vs $x$ with positivity constraint, $\sqrt{R}$ and $A_2^{\text{WW}}$	124
<b>Figure 75</b> Left / right beam pulse position and size differences for all $A_{\parallel}$ runs	125
<b>Figure 76</b> Electron rate binned versus beam position and size at the target	126
<b>Figure 77</b> $A_{\parallel}^{3\text{He}}$ for each energy and spectrometer	131
<b>Figure 78</b> $A_{\perp}^{3\text{He}}$ for each energy and spectrometer	133
<b>Figure 79</b> $A_{\parallel}^n$ for each energy and spectrometer	137
<b>Figure 80</b> $A_{\perp}^n$ for each energy and spectrometer	139
<b>Figure 81</b> $A_1^{3\text{He}}$ virtual photon- $^3\text{He}$ asymmetry versus $x$ at the measured average $Q^2$	141
<b>Figure 82</b> $A_2^{3\text{He}}$ versus $x$ at the measured average $Q^2$	142
<b>Figure 83</b> $A_1^n$ versus $x$ at the measured average $Q^2$	146
<b>Figure 84</b> $g_1/F_1$ versus $x$ at the measured average $Q^2$	147

<b>Figure 85</b> $A_1$ versus $Q^2$ .....	150
<b>Figure 86</b> $g_1/F_1$ versus $Q^2$ (statistical errors only) .....	152
<b>Figure 87</b> $g_1^n$ determined from the measured $A_{  }$ and $A_{\perp}$ at the measured average $Q^2$ .....	154
<b>Figure 88</b> $g_1^n$ from $A_1^n$ and $g_2^{WW}$ at $Q^2 = 2 \text{ (GeV/c)}^2$ .....	158
<b>Figure 89</b> $g_1^n$ from $g_1/F_1$ at $Q^2 = 2 \text{ (GeV/c)}^2$ .....	158
<b>Figure 90</b> Fit to $A_1^n$ used in high x extrapolation .....	163
<b>Figure 91</b> Radiative Correction Comparison (rough approximation of errors) .....	177
<b>Figure 92</b> Rel. Difference between method 1 and method 2 .....	179
<b>Figure 93</b> Comparison of dilution factors for the 4 5° used in the <i>Quick and Fall94</i> .....	179
<b>Figure 94</b> Gate widths where polarization bits are valid .....	180
<b>Figure 95</b> 4 5° Trigger OR distribution for 2/2 case and 2/2 but not 3/3 .....	181
<b>Figure 96</b> 7° Trigger OR distribution for 2/2 case and 2/2 but not 3/3 .....	181
<b>Figure 97</b> PRL with Cut 18 w/ <i>Quick</i> Corr. Factors .....	189
<b>Figure 98</b> Same as previous w/ 2/2 pol. .....	190
<b>Figure 99</b> Same as previous w/ <i>Cell</i> Clustering .....	190
<b>Figure 100</b> Same as previous w/ new Beam Cuts ( <i>Spring94</i> ) .....	191
<b>Figure 101</b> Same as previous w/ Neural cut .....	191
<b>Figure 102</b> Same as previous w/ Ghost cut .....	192
<b>Figure 103</b> Same as previous w/ new Beam and Target polarizations .....	192
<b>Figure 104</b> Same as previous w/ new Radiative Corrections .....	193
<b>Figure 105</b> Same as previous w/ new Dilution factor .....	193
<b>Figure 106</b> Same as previous w/ new dead time .....	194

<b>Figure 107</b> Same as previous w/ E-143 proton correction. ....	194
<b>Figure 108</b> Same as previous w/ new contamination correction. ....	195
<b>Figure 109</b> Cut 18 w/ <i>Quick</i> corrections & Cut 48 w/ all new factors and all data ....	195
<b>Figure 110</b> $A_1^n$ at $x = 0.035$ for various cuts. ....	196
<b>Figure 111</b> Integral of $g_1$ of various cuts (measured region). ....	196
<b>Figure 112</b> Cut 48 with and without resolution correction. ....	197
<b>Figure 113</b> Cut 46 versus Cut 48 (both without resolution correction) ....	198
<b>Figure 114</b> $4.5^\circ$ 19 GeV Neural Network efficiency. ....	199
<b>Figure 115</b> $4.5^\circ$ 22 GeV Neural Network efficiency. ....	199
<b>Figure 116</b> $4.5^\circ$ 25 GeV Neural Network efficiency. ....	200
<b>Figure 117</b> $7^\circ$ 19 GeV Neural Network efficiency. ....	200
<b>Figure 118</b> $7^\circ$ 22 GeV Neural Network efficiency. ....	201
<b>Figure 119</b> $7^\circ$ 25 GeV Neural Network efficiency. ....	201
<b>Figure 120</b> Smearing of momentum spectrum by using the shower energy resolution. ....	202