

## References

- [1] G.P. Lepage and S.J. Brodsky, “Exclusive processes in perturbative quantum chromodynamics”, Phys. Rev. D **22**, 2157 (1980).
- [2] R. Gupta, “Introduction to Lattice QCD”, hep-lat/9807028, (1998).
- [3] “Opportunities in Nuclear Science: A Long-Range Plan for the Next Decade”, DOE/NSF Nuclear Science Advisory Committee, April 2002.
- [4] M. D. Mestayer *et al.*, “The CLAS Drift Chamber System”, Nucl. Inst. and Meth. **A449**, 81 (2000).
- [5] G. Adams *et al.*, “The CLAS Cerenkov Detector”, Nucl. Instr. and Meth. **A465**, 414 (2001).
- [6] E.S. Smith *et al.*, “The Time-of-Flight System for CLAS”, Nucl. Inst. and Meth. **A432**, 265 (1999).
- [7] M. Amarian *et al.*, “The CLAS Forward Electromagnetic Calorimeter”, Nucl. Instr. and Meth. **A460**, 239 (2001).
- [8] S.Gilad, W. Bertozzi, and Z.-L. Zhou, “New observables in  $^2\text{H}(e, e'p)n$ ”, Nucl. Phys. **A631**, 276 (1998) and references therein.
- [9] A. Klimenko, S.E. Kuhn, P.E. Bosted, K.V. Dharmawardane, G.E. Dodge, T.A. Forest, Y. Prok, G. Adams, M. Amarian, P. Ambrozewicz, M. Anghinolfi, G. Asryan, H. Avakian, H. Bagdasaryan, N. Baillie, J.P. Ball, N.A. Baltzell, S. Barrow, V. Batourine, M. Battaglieri, K. Beard, I. Bedlinskiy, M. Bektasoglu, M. Bellis, N. Benmouna, A.S. Biselli, B.E. Bonner, S. Bouchigny, S. Boiarinov, R. Bradford, D. Branford, W.K. Brooks, S. Buhlmann, V.D. Burkert, C. Butuceanu, J.R. Calarco, S.L. Careccia, D.S. Carman, B. Carnahan, A. Cazes, S. Chen, P.L. Cole, P. Collins, P. Coltharp, D. Cords, P. Corvisiero, D. Crabb, H. Crannell, V. Crede, J.P. Cummings, R. De Masi, R. DeVita, E. De Sanctis, P.V. Degtyarenko, H. Denizli, L. Dennis, A. Deur, C. Djalali, J. Donnelly, D. Doughty, P. Dragovitsch, M. Dugger, S. Dytman, O.P. Dzyubak, H. Egiyan, K.S. Egiyan, L. Elouadrhiri, P. Eugenio, R. Fatemi, G. Fedotov, R.J. Feuerbach, H. Funsten, M. Garcon, G. Gavalian, G.P. Gilfoyle, K.L. Giovanetti, F.X. Girod, J.T. Goetz, E. Golovatch, A. Gonenc, R.W. Gothe, K.A. Griffioen, M. Guidal, M. Guillo, N. Guler, L. Guo, V. Gyurjyan, C. Hadjidakis, K. Hafidi, R.S. Hakobyan, J. Hardie, D. Heddle, F.W. Hersman, K. Hicks, I. Hleiqawi, M. Holtrop, M. Huertas, C.E. Hyde-Wright, Y. Ilieva, D.G. Ireland, B.S. Ishkhanov, E.L. Isupov, M.M. Ito, D. Jenkins, H.S. Jo, K. Joo, H.G. Juengst, C. Keith, J.D. Kellie, M. Khandaker, K.Y. Kim, K. Kim, W. Kim, A. Klein, F.J. Klein, M. Klusman, M. Kossov, L.H. Kramer, V. Kubarovsky, J. Kuhn, S.V. Kuleshov, J. Lachniet, J.M. Laget, J. Langheinrich, D. Lawrence, Ji Li, A.C.S. Lima, K. Livingston, H. Lu, K. Lukashin, M. MacCormick, J.J. Manak, N. Markov, S. McAleer, B. McKinnon, J.W.C. McNabb, B.A. Mecking, M.D. Mestayer, C.A. Meyer, T. Mibe, K. Mikhailov, R. Minehart, M. Mirazita, R. Miskimen, V. Mokeev, L. Morand, S.A. Morrow, M. Moteabbed, J. Mueller, G.S. Mutchler, P. Nadel-Turonski, J. Napolitano, R. Nasseripour, S. Niccolai, G. Niculescu, I. Niculescu, B.B. Niczyporuk, M.R. Niroula, R.A. Niyazov, M. Nozar, G.V. O’Rielly, M. Osipenko, A.I. Ostrovidov, K. Park, E. Pasyuk, C. Paterson, S.A. Philips, J. Pierce, N. Pivnyuk, D. Pocanic, O. Pogorelko, E. Polli, S. Pozdniakov, B.M. Preedom, J.W. Price, D. Protopopescu, L.M. Qin, B.A. Raue, G. Riccardi, G. Ricco, M. Ripani, F. Ronchetti, G. Rosner, P. Rossi, D. Rowntree, P.D. Rubin, F. Sabatie, C. Salgado, J.P. Santoro, V. Sapunenko, R.A. Schumacher, V.S. Serov, Y.G. Sharabian, J. Shaw, N.V. Shvedunov, A.V.

- Skabelin, E.S. Smith, L.C. Smith, D.I. Sober, A. Stavinsky, S.S. Stepanyan, S. Stepanyan, B.E. Stokes, P. Stoler, S. Strauch, R. Suleiman, M. Taiuti, S. Taylor, D.J. Tedeschi, U. Thoma, R. Thompson, A. Tkabladze, S. Tkachenko, L. Todor, C. Tur, M. Ungaro, M.F. Vineyard, A.V. Vlassov, L.B. Weinstein, D.P. Weygand, M. Williams, E. Wolin, M.H. Wood, A. Yegneswaran, J. Yun, L. Zana, J. Zhang, B. Zhao, and Z. Zhao (the CLAS Collaboration), *Phys. Rev. C* **73**, 035212 (2006).
- [10] PAC 14 Few-Body Workshop, JLab Program Advisory Committee, Williamsburg, VA, July, 1998.
  - [11] S.Jeschonnek, private communication.
  - [12] H.Arenhoevel, private communication.
  - [13] J.M.Laget, private communication.
  - [14] G.P. Gilfoyle, W.K. Brooks, B.A. Mecking, S.E. Kuhn, L.B.Weinstein, and M.F. Vineyard, “Out-of-Plane Measurements of the Structure Functions of the Deuteron”, CLAS Approved Analysis (2003).
  - [15] M.N. Rosenbluth, “High Energy Elastic Scattering of Electrons on Protons”, *Phys. Rev.* **79**, 615 (1950).
  - [16] M.Diehl, “Introduction to Generalized Parton Distributions”, [wwwcompass.cern.ch/compass/publications/2004\\_yellow/Body/diehl\\_new.pdf](http://wwwcompass.cern.ch/compass/publications/2004_yellow/Body/diehl_new.pdf), last accessed Sep 4, 2006.
  - [17] J.D. Ashley, D.B. Leinweber, A.W. Thomas, and R.D.Young, “Nucleon electromagnetic form factors from lattice QCD”, *Eur. Phys. J A* **19** s01, 9 (2004).
  - [18] C.E. Hyde-Wright and K.deJager, “Electromagnetic Form Factors of the Nucleon and Compton Scattering”, *Ann. Rev. Nucl. Part. Sci.* **54**, 217 (2004).
  - [19] W. Brooks and M.F. Vineyard, “The Neutron Magnetic Form Factor from Precision Measurements of the Ratio of Quasielastic Electron-Neutron to Electron-Proton Scattering in Deuterium”, Jefferson Lab Experiment E94-017 1994.
  - [20] J.D. Lachniet, “A High Precision Measurement of the Neutron Magnetic Form Factor Using the CLAS Detector”, thesis, Carnegie Mellon University.
  - [21] “Office of Science Strategic Plan, February, 2004”, US Department of Energy Office of Science, February, 2004.
  - [22] “Measurement of the Neutron Magnetic Form Factor at High  $Q^2$  Using the Ratio Method in Deuterium”, G.P. Gilfoyle, M.F. Vineyard, S.E. Kuhn, J.D. Lachniet, L.B.Weinstein, K. Hafidi, M. Holtrop, M. Garcon, Jefferson Lab Letter-of-Intent LOI-12-06-107 (2006).
  - [23] “Quark Propagation and Hadron Formation”, K. Hafidi, J.Arrington, L. El Fassi, D.F. Geesaman, R.J. Holt, B. Mustapha, D.H. Potterveld, P.E.Reimer, P. Solvignon, K. Joo, M. Ungaro, G. Niculescu, I. Niculescu, W.K. Brooks, M. Holtrop, K. Hicks, T. Mibe, L.B. Weinstein, M. Wood, G.P. Gilfoyle, H. Hakobyan, Jefferson Lab Experiment PR-12-06-117 (2006).
  - [24] G.P. Gilfoyle and A. Afanasev, “Radiative Corrections for Deuteron Electro disintegration”, CLAS-Note 2005-022, October 31, 2005.

- [25] J.Schwinger, “Quantum Electrodynamics. III. The Electromagnetic Properties of the Electron - Radiative Corrections to Scattering”, *Phys. Rev.*, **76**, 790 (1949).
- [26] L.W.Mo and Y.S.Tsai, “Radiative Corrections to Elastic and Inelastic ep and up Scattering”, *Rev. Mod. Phys.*, **41**, 205 (1969).
- [27] A.Afanasev, I.Akushevich, V.Burkert, and K.Joo, “QED radiative corrections in processes of exclusive pion electroproduction ”, *Phys.Rev.*, **D66**, 074004, 2002.
- [28] J.Adam, Jr., F.Gross, S.Jeschonnek, P.Ulmer, and J.W. Van Orden, “Covariant description of inelastic electron-deuteron scattering: Predictions of the relativistic impulse approximation”, *Phys. Rev. C*, **66**, 044003 (2002).
- [29] “Pre-Conceptual Design Report (pCDR) for The Science and Experimental Equipment for The 12 GeV Upgrade of CEBAF”, Jefferson Lab report 2004.
- [30] M.F. Vineyard, “Inclusive  $\eta$  Photoproduction in Nuclei”, Jefferson Lab Experiment E93-008 1993.
- [31] K. Hicks, M. Mestayer, “Measurement of the Structure Functions for Kaon Electroproduction”, Jefferson Lab Experiment E93-030 1993.
- [32] K. Hicks, S. Stepanyan, “Investigation of Exotic Baryons States in Photoproduction Reactions with CLAS”, Jefferson Lab Experiment E03-113 2003.
- [33] G.F. Smoot *et al.*, “Structure in the COBE differential microwave radiometer first-year maps,” *Astrophys. J. Lett.*, **396**, L1 (1992).
- [34] C.L. Bennett *et al.*, “First-Year Wilkinson Microwave Anisotropy Probe (WMAP) Observations: Preliminary Maps and Basic Results,” *Astrophys. J. Supp.*, **148**, 1 (2003).
- [35] J.M. Kovac *et al.*, “Detection of polarization in the cosmic microwave background using DASI,” *Nature*, **420**, 772 (2002).
- [36] A. Kogut *et al.*, “First-Year Wilkinson Microwave Anisotropy Probe (WMAP) Observations: Temperature-Polarization Correlation,” *Astrophys. J. Supp.*, **148**, 161 (2003).
- [37] L. Page *et al.*, “Three Year Wilkinson Microwave Anisotropy Probe (WMAP) Observations: Polarization Analysis,” astro-ph/0603450, submitted to *Astrophys. J.* (2006).
- [38] A.C.S. Readhead *et al.*, “Polarization Observations with the Cosmic Background Imager,” *Science*, **306**, 836 (2004).
- [39] E.M. Leitch *et al.*, “Degree Angular Scale Interferometer 3 Year Cosmic Microwave Background Polarization Results,” *Astrophys. J.*, **624**, 10 (2005).
- [40] D. Barkats *et al.*, “First Measurements of the Polarization of the Cosmic Microwave Background Radiation at Small Angular Scales from CAPMAP,” *Astrophys. J. Lett.*, **619**, L127 (2005).
- [41] W.H. Kinney, “Constraining inflation with cosmic microwave background polarization,” *Phys. Rev. D*, **58**, 123506 (1998).
- [42] M. Zaldarriaga, “Polarization of the microwave background in reionized models,” *Phys. Rev. D.*, **55**, 1822 (1997).

- [43] P.J.E. Peebles, S. Seager, and W. Hu, “Delayed Recombination,” *Astrophys. J. Lett.*, **539**, L1 (2000).
- [44] M. Zaldarriaga and U. Seljak, “Gravitational lensing effect on cosmic microwave background polarization,” *Phys. Rev. D*, **58**, 023003 (1998).
- [45] M. Zaldarriaga and U. Seljak, “All-sky analysis of polarization in the microwave background,” *Phys. Rev. D*, **55**, 1830 (1997).
- [46] M. Kamionkowski, A. Kosowsky, and A. Stebbins, “Statistics of cosmic microwave background polarization,” *Phys. Rev. D*, **55**, 7368 (1997).
- [47] J. Bock, S. Church, M. Devlin, G. Hinshaw, A. Lange, A. Lee, L. Page, B. Partridge, J. Ruhl, M. Tegmark, P. Timbie, R. Weiss, B. Winstein, & M. Zaldarriaga, Task Force on Cosmic Microwave Background Research, available at <http://arxiv.org/abs/astro-ph/0604101> (2006).
- [48] Astronomy & Astrophysics Survey Committee (National Research Council), *Astronomy & Astrophysics in the New Millennium*, National Academies Press (2001).
- [49] Committee on the Physics of the Universe (National Research Council), *Connecting Quarks with the Cosmos: 11 Science Questions for the New Century*, National Academies Press (2003).
- [50] <http://universe.nasa.gov/program/probes.html>
- [51] P. Timbie *et al.*, “The Einstein Polarization Interferometer for Cosmology (EPIC) and the Millimeter-wave Bolometric Interferometer (MBI),” to appear in Proceedings of the Fundamental Physics with CMB Workshop, UC Irvine, *New Astron. Rev.*, 50, 999 (2006).
- [52] A.L. Korotkov *et al.*, “The millimeter-wave bolometric interferometer,” *Proc. SPIE, Millimeter and Submillimeter Detectors and Instrumentation for Astronomy III*; Jonas Zmuidzinas *et al.*, eds., **6275**, 285 (2006).
- [53] W. Hu, M.M. Hedman, and M. Zaldarriaga, “Benchmark parameters for CMB polarization experiments,” *Phys. Rev. D*, **67**, 043004 (2003).
- [54] L. Knox and Y.-S. Song, “Limit on the Detectability of the Energy Scale of Inflation,” *Phys. Rev. Lett.*, **89**, 011303 (2002).
- [55] A. Lewis, A. Challinor, and N. Turok, “Analysis of CMB polarization on an incomplete sky,” *Phys. Rev. D*, **65**, 023505 (2002).
- [56] E.F. Bunn, “Detectability of Microwave Background Polarization,” *Phys. Rev. D*, **65**, 043003 (2002). See also erratum at *Phys. Rev. D*, **66**, 069902 (2002).
- [57] E.F. Bunn, M. Tegmark, M. Zaldarriaga, and A. de Oliveira-Costa, “E/B decomposition of finite pixelized CMB maps,” *Phys. Rev. D*, **67**, 203501 (2003).
- [58] C.-G. Park and K.-W. Ng, “E/B Separation in Cosmic Microwave Background Interferometry,” *Astrophys. J.*, **609**, 15 (2004).
- [59] E.F. Bunn, “Systematic Errors in Cosmic Microwave Background Interferometry,” *astro-ph/0607312*, submitted to *Phys. Rev. D* (2006).
- [60] <http://crd.lbl.gov/~borrill/cmb/madcap/>

- [61] E.F. Bunn and M. White, “Mosaicking with Cosmic Microwave Background Interferometers,” *Astrophys. J.*, 655, 21 (2007).
- [62] J. Högbom, “Aperture Synthesis with a Non-Regular Distribution of Interferometer Baselines,” *Astron. Astrophys. Supp.*, **15**, 417 (1974).
- [63] K. Maisinger, M.P. Hobson, and A. Lasenby, “A maximum entropy method for reconstructing interferometer maps of fluctuations in the cosmic microwave background radiation,” *Mon. Not. R. Astron. Soc.*, **290**, 313 (1997).
- [64] S. Masi *et al.*, “Instrument, Method, Brightness and Polarization Maps from the 2003 flight of BOOMERanG,” *Astron. Astrophys.*, 458, 687 (2006).
- [65] M.P. Hobson and K. Maisinger, “Maximum-likelihood estimation of the cosmic microwave background power spectrum from interferometer observations,” *Mon. Not. R. Astron. Soc.*, **334**, 569 (2002).
- [66] N. Christensen, R. Meyer, L. Knox, and B. Luey, “Bayesian Methods for Cosmological Parameter Estimation from Cosmic Microwave Background Measurements,” *Class. Quant. Grav.*, **18**, 2677 (2001).
- [67] “Joint Statement of Principles of Undergraduate Research, Scholarship, and Creative Activities,” endorsed by NCUR Board of Governors, April 2005 and CUR governing board, June 2005, Council on Undergraduate Research, <http://www.cur.org/SummitPosition.html>, last accessed Sep 24, 2006, and references therein.
- [68] R.Burrell and G.P.Gilfoyle, “Momentum Corrections for the CLAS E5 Data Set”, University of Richmond Symposium, April 21, 2006.
- [69] K.Greenholt and G.P.Gilfoyle, “Fiducial Cuts on CLAS for the E5 Data Set”, *Bull. Am. Phys. Soc.*, Fall DNP Meeting, FR.0006(2005).
- [70] R.Burrell and G.P.Gilfoyle, “Momentum Corrections for the E5 Data Set”, *Bull. Am. Phys. Soc.*, Fall DNP Meeting, FR.00068(2005).
- [71] K.Greenholt and G.P.Gilfoyle, “Generating Fiducial Cuts for CLAS E5”, University of Richmond Symposium, April 14, 2005.
- [72] R.Burrell and G.P.Gilfoyle, “Momentum Corrections for the CLAS E5 Data Set”, University of Richmond Symposium, April 14, 2005.
- [73] K.Greenholt and G.P.Gilfoyle, “Generating Fiducial Cuts for CLAS E5”, *Bull. Am. Phys. Soc.*, April Meeting, S.06(2005).
- [74] R.Burrell and G.P.Gilfoyle, “Momentum Corrections for the CLAS E5 Data Set”, *Bull. Am. Phys. Soc.*, April Meeting, S.07(2005).
- [75] R.Burrell, K. Gill, and G.P.Gilfoyle, “CLAS Simulations of  $D(\vec{e}, e'p)n$ ”, *Bull. Am. Phys. Soc.*, Fall DNP Meeting, 3A.00012(2006).
- [76] K.Greenholt and G.P.Gilfoyle, “Hadron Fiducial Cuts for the CLAS E5 Data”, *Bull. Am. Phys. Soc.*, Fall DNP Meeting, 3A.00030(2006).

- [77] G. Larson, E.F. Bunn, V. Kasliwal, M. McCann, "Filtering Dust Contamination from CMB Data with Wavelets and Radon Transforms", American Astronomical Society Meeting, Washington, DC, January 2006.
- [78] M. McCann, E.F. Bunn, R. Chan, V. Kasliwal, "The Three-Point Correlation Function of Galactic Dust: Implications for Microwave Background Non-Gaussianity", American Astronomical Society Meeting, Denver, CO, June 2, 2004.
- [79] V. Kasliwal, E.F. Bunn, R. Chan, M. McCann, "The Bispectrum of Galactic Dust: Implications for Microwave Background Non-Gaussianity", American Astronomical Society Meeting, Denver, CO, June 2, 2004.
- [80] M. McCann, E.F. Bunn, "The Three-Point Correlation Function as an Indicator of non-Gaussianity in the Cosmic Microwave Background Radiation," University of Richmond Symposium, April 20, 2005.
- [81] F. Chinchilla, M. F. Vineyard, and G. P. Gilfoyle, "Development and Maintenance of a Linux Computing Cluster", poster presented at the Conference Experience for Undergraduates at the Fall 2000 Meeting of the Division of Nuclear Physics of the American Physical Society, Williamsburg, VA, Oct. 4-7, 2000.
- [82] V. Davda and G.P. Gilfoyle, "Maintenance and Upgrading of the Richmond Physics Supercomputing Cluster", poster presented at the Conference Experience for Undergraduates at the Fall 2003 Meeting of the Division of Nuclear Physics of the American Physical Society, Tucson, AZ, Oct 30 - Nov 1, 2003.
- [83] E.F. Bunn, "Probing the Universe on gigaparsec scales with remote cosmic microwave background quadrupole measurements," Phys. Rev. D, 73, 123517 (2006).
- [84] T. Faulkner, M. Tegmark, E.F. Bunn, and Y. Mao, "Constraining  $f(R)$  Gravity as a Scalar Tensor Theory," astro-ph/0612569 (2006).
- [85] G.P. Gilfoyle, CLAS Collaboration, "Out-of-Plane Measurements of the Fifth Structure Function of the Deuteron", Bull. Am. Phys. Soc., Fall DNP Meeting, DF.0001(2006).
- [86] D. Jenkins, "  $\pi^+$  Acceptance Corrections for  $\pi \rightarrow \mu$  Decay", CLAS Note 2004-035, June 10, 2005.
- [87] D. Jenkins, "A Comparison of Simple and Full Acceptance", CLAS Note 2004-043, June 10, 2005.