

Literaturverzeichnis

- [1] M. Göckeler *et al.*, „Nonperturbative renormalisation of composite operators in lattice QCD”, Nucl. Phys. B **544** (1999) 699
- [2] A. D. Martin, R. G. Roberts, W. J. Stirling and R. S. Thorne, „MRST2001: Partons and alpha(s) from precise deep inelastic scattering and Tevatron jet data” Eur. Phys. J. C **23** (2002) 73
- [3] K. Orginos, T. Blum and S. Ohta, „Nucleon structure functions with domain wall fermions”, arXiv:hep-lat/0505024
- [4] K. Symanzik, „Continuum Limit And Improved Action In Lattice Theories. 1. Principles And Nucl. Phys. B **226** (1983) 187
- [5] M. Lüscher und P. Weisz, „On-Shell Improved Lattice Gauge Theories”, Commun. Math. Phys. **97** (1985) 59 [Erratum-ibid. **98** (1985) 433]
- [6] M. G. Alford, W. Dimm, G. P. Lepage, G. Hockney und P. B. Mackenzie, „Lattice QCD on small computers”, Phys. Lett. B **361** (1995) 87
- [7] C. Gattringer, R. Hoffmann und S. Schaefer, „Setting the scale for the Luescher-Weisz action”, Phys. Rev. D **65**, 094503 (2002)
- [8] K. Fujikawa, „Path Integral Measure For Gauge Invariant Fermion Theories”, Phys. Rev. Lett. **42** (1979) 1195
- [9] K. Fujikawa, „Path Integral For Gauge Theories With Fermions”, Phys. Rev. D **21** (1980) 2848 [Erratum-ibid. D **22** (1980) 1499]
- [10] C. Vafa und E. Witten, „Restrictions On Symmetry Breaking In Vector - Like Gauge Theories”, Nucl. Phys. B **234** (1984) 173
- [11] H. B. Nielsen und M. Ninomiya, „Absence Of Neutrinos On A Lattice. 1. Proof By Homotopy Theory”, Nucl. Phys. B **185** (1981) 20 [Erratum-ibid. B **195** (1982) 541]
- [12] H. B. Nielsen und M. Ninomiya, „Absence Of Neutrinos On A Lattice. 2. Intuitive Topological Proof”, Nucl. Phys. B **193** (1981) 173
- [13] H. B. Nielsen und M. Ninomiya, „No Go Theorem For Regularizing Chiral Fermions”, Phys. Lett. B **105** (1981) 219

- [14] F. Niedermayer, „Exact chiral symmetry, topological charge and related topics”, Nucl. Phys. Proc. Suppl. **73** (1999) 105
- [15] P. H. Ginsparg und K. G. Wilson, „A Remnant Of Chiral Symmetry On The Lattice”, Phys. Rev. D **25** (1982) 2649.
- [16] S. Capitani, M. Göckeler, R. Horsley, P. E. L. Rakow und G. Schierholz, „Operator improvement for Ginsparg-Wilson fermions”, Phys. Lett. B **468** (1999) 150
- [17] P. Hasenfratz, S. Hauswirth, T. Jorg, F. Niedermayer and K. Holland, „Testing the fixed-point QCD action and the construction of chiral currents”, Nucl. Phys. B **643** (2002) 280
- [18] M. Lüscher, „Exact chiral symmetry on the lattice and the Ginsparg-Wilson relation”, Phys. Lett. B **428** (1998) 342
- [19] Y. Kikukawa und A. Yamada, „Axial vector current of exact chiral symmetry on the lattice”, Nucl. Phys. B **547** (1999) 413
- [20] P. Hasenfratz, „Prospects for perfect actions”, Nucl. Phys. Proc. Suppl. **63** (1998) 53
- [21] W. Bietenholz und U. J. Wiese, „Perfect Lattice Actions for Quarks and Gluons”, Nucl. Phys. B **464** (1996) 319
- [22] T. DeGrand, A. Hasenfratz und D. C. Zhu, „Instantons and Fixed Point Actions in SU(2) Gauge Theory”, Nucl. Phys. B **475** (1996) 321
- [23] C. Gattringer *et al.* [BGR-Kollaboration], „Quenched spectroscopy with fixed-point and chirally improved fermions”, Nucl. Phys. B **677** (2004) 3
- [24] P. Hasenfratz, K. J. Juge und F. Niedermayer [Bern-Graz-Regensburg-Kollaboration], „New results on cut-off effects in spectroscopy with the fixed point action”, JHEP **0412** (2004) 030
- [25] D. B. Kaplan, „A Method for simulating chiral fermions on the lattice”, Phys. Lett. B **288** (1992) 342
- [26] H. Neuberger, „More about exactly massless quarks on the lattice”, Phys. Lett. B **427** (1998) 353
- [27] L. Giusti, M. Lüscher, P. Weisz und H. Wittig, „Lattice QCD in the epsilon-regime and random matrix theory”, JHEP **0311** (2003) 023
- [28] W. Bietenholz, „On the absence of ultralocal Ginsparg-Wilson fermions”, arXiv:hep-lat/9901005
- [29] I. Horvath, „Ginsparg-Wilson relation and ultralocality”, Phys. Rev. Lett. **81** (1998) 4063

- [30] P. Hernandez, K. Jansen und M. Lüscher, „Locality properties of Neuberger's lattice Dirac operator”, Nucl. Phys. B **552** (1999) 363
- [31] A. Morel, „Chiral Logarithms In Quenched QCD”, J. Phys. (France) **48** (1987) 1111.
- [32] C. W. Bernard und M. F. L. Golterman, „Chiral perturbation theory for the quenched approximation of QCD”, Phys. Rev. D **46** (1992) 853
- [33] S. R. Sharpe, „Chiral Logarithms In Quenched M(Pi) And F(Pi)”, Phys. Rev. D **41** (1990) 3233
- [34] P. H. Damgaard und K. Splittorff, „Partially quenched chiral perturbation theory and the replica method”, Phys. Rev. D **62** (2000) 054509
- [35] J. Gasser und H. Leutwyler, „Spontaneously Broken Symmetries: Effective Lagrangians At Finite Volume”, Nucl. Phys. B **307** (1988) 763
- [36] P. Hasenfratz und H. Leutwyler, „Goldstone Boson Related Finite Size Effects In Field Theory And Critical Phenomena With O(N) Symmetry”, Nucl. Phys. B **343** (1990) 241
- [37] J. Gasser und H. Leutwyler, „Thermodynamics Of Chiral Symmetry”, Phys. Lett. B **188** (1987) 477.
- [38] I. Montvay und G. Münster, „Quantum fields on a lattice”, Cambridge University Press, 1994
- [39] M. Lüscher, „Construction Of A Selfadjoint, Strictly Positive Transfer Matrix For Euclidean Lattice Gauge Theories”, Commun. Math. Phys. **54** (1977) 283
- [40] M. Lüscher and P. Weisz, „Definition And General Properties Of The Transfer Matrix In Continuum Limit Improved Lattice Gauge Theories”, Nucl. Phys. B **240** (1984) 349
- [41] J. Foley, K. J. Juge, A. O'Cais, M. Peardon, S. M. Ryan und J. I. Skullerud, „Practical all-to-all propagators for lattice QCD”, arXiv:hep-lat/0505023.
- [42] R. Horsley, „The hadronic structure of matter - a lattice approach”, Habilitations-schrift, 2000
- [43] C. R. Allton *et al.* [UKQCD-Kollaboration], „Gauge invariant smearing and matrix correlators using Wilson fermions at Beta = 6.2”, Phys. Rev. D **47** (1993) 5128
- [44] T. DeGrand und S. Schaefer, „Improving meson two-point functions in lattice QCD”, Comput. Phys. Commun. **159** (2004) 185
- [45] L. Giusti, P. Hernandez, M. Laine, P. Weisz und H. Wittig, „Low-energy couplings of QCD from current correlators near the chiral limit”, JHEP **0404** (2004) 013

- [46] A. O'Cais, K. J. Juge, M. J. Peardon, S. M. Ryan und J. I. Skullerud [TrinLat-Kollaboration], „Improving algorithms to compute all elements of the lattice quark propagator”, arXiv:hep-lat/0409069
- [47] Y. Saad, „Iterative Methods for Sparse Linear Systems”, PWS Publishers, 1996
- [48] L. Giusti, C. Hoelbling, M. Lüscher und H. Wittig, „Numerical techniques for lattice QCD in the epsilon-regime”, Comput. Phys. Commun. **153** (2003) 31
- [49] S. Capitani, „Lattice perturbation theory”, Phys. Rept. **382** (2003) 113
- [50] G. Martinelli, C. Pittori, C. T. Sachrajda, M. Testa und A. Vladikas, „A General method for nonperturbative renormalization of lattice operators”, Nucl. Phys. B **445** (1995) 81
- [51] O. V. Tarasov, A. A. Vladimirov und A. Y. Zharkov, „The Gell-Mann-Low Function Of QCD In The Three Loop Approximation”, Phys. Lett. B **93** (1980) 429
- [52] S. A. Larin und J. A. M. Vermaseren, „The Three loop QCD Beta function and anomalous dimensions”, Phys. Lett. B **303** (1993) 334
- [53] T. van Ritbergen, J. A. M. Vermaseren und S. A. Larin, „The four-loop beta function in quantum chromodynamics”, Phys. Lett. B **400** (1997) 379
- [54] J. A. Gracey, „Three loop anomalous dimension of the second moment of the transversity operator in the MS-bar and RI' schemes”, Nucl. Phys. B **667** (2003) 242
- [55] S. Booth *et al.* [QCDSF-UKQCD-Kollaboration], „Determination of Lambda(MS-bar) from quenched and N(f) = 2 dynamical QCD”, Phys. Lett. B **519** (2001) 229
- [56] T. Bakayev, M. Göckeler, R. Horsley, D. Pleiter, P. E. L. Rakow, G. Schierholz und H. Stüben [QCDSF-UKQCD-Kollaboration], „Non-perturbative renormalisation and improvement of the local vector current for quenched and unquenched Wilson fermions”, Phys. Lett. B **580** (2004) 197
- [57] M. L. Paciello, S. Petrarca, B. Taglienti und A. Vladikas, „Gribov noise of the lattice axial current renormalization constant”, Phys. Lett. B **341** (1994) 187
- [58] I. L. Bogolubsky, V. K. Mitrjushkin, M. Müller-Preussker, P. Peter und N. V. Zverev, „Lorentz gauge fixing and the Gribov problem: The fermion correlator in lattice compact QED with Wilson fermions”, Nucl. Phys. Proc. Suppl. **83** (2000) 962
- [59] T. Blum *et al.*, „Non-perturbative renormalisation of domain wall fermions: Quark bilinears”, Phys. Rev. D **66** (2002) 014504
- [60] J. A. Gracey, „Three loop anomalous dimension of non-singlet quark currents in the RI' scheme”, Nucl. Phys. B **662** (2003) 247

- [61] M. Göckeler, R. Horsley, E. M. Ilgenfritz, H. Perlt, P. Rakow, G. Schierholz und A. Schiller, „Lattice Operators for Moments of the Structure Functions and their Transformation under the Hypercubic Group”, Phys. Rev. D **54** (1996) 5705
- [62] R. Horsley, H. Perlt, P. E. L. Rakow, G. Schierholz und A. Schiller, „Renormalisation of one-link quark operators for overlap fermions with Luescher-Weisz gauge action”, arXiv:hep-lat/0505015
- [63] R. Horsley, H. Perlt, P. E. L. Rakow, G. Schierholz und A. Schiller [QCDSF-Kollaboration], „One-loop renormalisation of quark bilinears for overlap fermions with improved gauge actions”, Nucl. Phys. B **693** (2004) 3 [Erratum-ibid. B **713** (2005) 601]
- [64] M. Gell-Mann, R. J. Oakes und B. Renner, „Behavior Of Current Divergences Under $SU(3) \times SU(3)$ ”, Phys. Rev. **175**, 2195 (1968)
- [65] M. Booth, G. Chiladze und A. F. Falk, „Quenched chiral perturbation theory for vector mesons”, Phys. Rev. D **55** (1997) 3092
- [66] J. N. Labrenz und S. R. Sharpe, „Quenched chiral perturbation theory for baryons”, Phys. Rev. D **54** (1996) 4595
- [67] E. Witten, „Current Algebra Theorems For The $U(1)$ 'Goldstone Boson'”, Nucl. Phys. B **156** (1979) 269
- [68] G. Veneziano, „ $U(1)$ Without Instantons”, Nucl. Phys. B **159** (1979) 213
- [69] L. Giusti, G. C. Rossi, M. Testa und G. Veneziano, „The $U(1)A$ problem on the lattice with Ginsparg-Wilson fermions”, Nucl. Phys. B **628** (2002) 234
- [70] J. C. Osborn, D. Toublan und J. J. M. Verbaarschot, „From chiral random matrix theory to chiral perturbation theory”, Nucl. Phys. B **540** (1999) 317
- [71] P. H. Damgaard, „Quenched finite volume logarithms”, Nucl. Phys. B **608** (2001) 162 [arXiv:hep-lat/0105010].
- [72] J. J. M. Verbaarschot und T. Wettig, „Random matrix theory and chiral symmetry in QCD”, Ann. Rev. Nucl. Part. Sci. **50** (2000) 343
- [73] P. H. Damgaard und S. M. Nishigaki, „Distribution of the k-th smallest Dirac operator eigenvalue”, Phys. Rev. D **63** (2001) 045012
- [74] O. Nachtmann, „Elementary Particle Physics: Concepts And Phenomena”, Springer, 1990
- [75] H. Abele, „The standard model and the neutron beta-decay”, Nucl. Instrum. Meth. A **440** (2000) 499

Danksagung

Ich danke Herrn Prof. Gerrit Schierholz und Herrn Prof. Volkard Linke für die Vergabe des Themas sowie für die Betreuung der Arbeit.

Den Mitgliedern der QCDSF-Kollaboration, insbesondere Meinulf Göckeler, Martin Gürtler, Roger Horsley, Dirk Pleiter, Paul Rakow und Volker Weinberg, danke ich für zahlreiche Diskussionen und Anregungen.

Bei Martin Gürtler und Volker Weinberg bedanke ich mich für ihre Hilfe bei meinen Computerproblemen sowie für das Korrekturlesen der Arbeit.

Schließlich bedanke ich mich bei meiner Familie für ihre Unterstützung.

