

REFERENCES

- [1] S. Eidelman *et al.* [Particle Data Group], *Review of particle physics*, Phys. Lett. B **592**, 1 (2004).
- [2] L. Gibbons and M. Battaglia, “Determination of $|V_{ub}|$,” in [1].
- [3] I. Hinchliffe, “Quantum chromodynamics,” in [1].
- [4] B. Kayser, “Neutrino mass, mixing, and flavor change,” in [1].
- [5] D. E. Groom *et al.* [Particle Data Group Collaboration], *Review of particle physics*, Eur. Phys. J. **C15**, 1 (2000).
- [6] K. Hagiwara *et al.* [Particle Data Group Collaboration], *Review of particle physics*, Phys. Rev. D **66**, 010001 (2002).
- [7] D. Griffiths, *Introduction to Elementary Particles*, John Wiley and Sons, 1987.
- [8] F. Halzen and A. D. Martin, *Quarks and Leptons: An Introductory Course in Modern Particle Physics*, John Wiley and Sons, 1984.
- [9] D. H. Perkins, *Introduction to High Energy Physics*, Addison-Wesley Publishing Company, 1987.
- [10] Excerpted from “The Standard Model of Fundamental Particles and Interactions Chart,” Contemporary Physics Education Project, 1999 [www.particleadventure.org].
- [11] L. K. Gibbons, “Measurement of the CKM matrix element $|V_{ub}|$ and exclusive $B \rightarrow \pi\ell\nu$ and $B \rightarrow \rho\ell\nu$ decays,” Annu. Rev. Nucl. Part. Sci. **48**, 121 (1998).
- [12] The LEP VUB Working Group, Note LEPVUB-01/01.
- [13] The Heavy Flavors Averaging Group, www.slac.stanford.edu/xorg/hfag/.
- [14] M. Battaglia *et al.*, “The CKM matrix and the unitarity triangle,” results of the Workshop on the CKM Unitarity Triangle held at CERN 13-16 Feb 2002, arXiv:hep-ph/0304132.
- [15] A. J. Buras, “Weak Hamiltonian, CP violation and rare decays,” lectures delivered at Les Houches, arXiv:hep-ph/9806471.
- [16] A. Astbury, B. A. Campbell, F. C. Khanna, and M. G. Vincter, eds., *Fundamental Interactions*, proceedings of the 16th Lake Louise Winter Institute, held in Lake Louise, Alberta Canada, 18-24 Feb 2001. Published by World Scientific, 2002.

- [17] G. G. Ross, “Beyond the Standard Model” in [16], pp. 60–119.
- [18] N. Cabibbo, “Unitary symmetry and leptonic decays,” *Phys. Rev. Lett.* **10**, 531 (1963).
M. Kobayashi and K. Maskawa, “CP Violation in the renormalizable theory of weak interaction,” *Prog. Theo. Phys.* **49**, 652 (1973).
- [19] L. Wolfenstein, “Parameterization of the Kobayashi-Maskawa matrix,” *Phys. Rev. Lett.* **51**, 1945 (1983).
- [20] J. D. Richman and P. R. Burchat, “Leptonic and semileptonic decays of charm and bottom hadrons,” *Rev. Mod. Phys.* **67**, 893 (1995) [[arXiv:hep-ph/9508250](#)].
- [21] J. D. Richman, “Heavy-quark physics and CP violation,” prepared for Les Houches Summer School in Theoretical Physics, Session 68: Probing the Standard Model of Particle Interactions, Les Houches, France, 28 Jul - 5 Sep 1997.
- [22] P. F. Harrison and H. R. Quinn, eds., *The BaBar Physics Book*, **SLAC R-504**, Oct 1998.
- [23] M. Neubert, “Heavy quark symmetry,” *Phys. Rept.* **245**, 259 (1994) [[arXiv:hep-ph/9306320](#)].
- [24] M. Neubert, “Introduction to B physics,” [arXiv:hep-ph/0001334](#).
- [25] A. F. Falk, “The heavy quark expansion of QCD,” [arXiv:hep-ph/9610363](#).
- [26] M. Neubert, “Heavy-quark effective theory,” [arXiv:hep-ph/9610266](#).
- [27] M. Neubert, “B decays and the heavy-quark expansion,” [arXiv:hep-ph/9702375](#).
- [28] M. Neubert, “Theory of inclusive B decays,” *Nucl. Phys. Proc. Suppl.* **59**, 101 (1997) [[arXiv:hep-ph/9702310](#)].
- [29] M. Neubert, *Topics in Heavy Quark Physics*, lectures given at Cornell University, Fall 1999.
- [30] I. I. Bigi, M. A. Shifman, N. G. Uraltsev, and A. I. Vainshtein, “On the motion of heavy quarks inside hadrons: Universal distributions and inclusive decays,” *Int. J. Mod. Phys.* **A9**, 2467 (1994) [[arXiv:hep-ph/9312359](#)].
- [31] I. I. Bigi, “Memo on extracting $|V(cb)|$ and $|V(ub)/V(cb)|$ from semileptonic B decays,” [arXiv:hep-ph/9907270](#).
- [32] Z. Ligeti, “ $|V_{cb}|$ and $|V_{ub}|$ from B decays: Recent progress and limitations,” [hep-ph/9908432](#).

- [33] T. O. Meyer, “Extracting $|V_{ub}|$ From Inclusive Measurements of $B \rightarrow X_u \ell \nu$,” prepared for Cornell Ph.D. candidacy (“A”) exam, October 2000.
- [34] M. Battaglia, “Determinations of $|V_{ub}|$ with inclusive techniques at LEP,” [arXiv:hep-ex/0008066](#).
- [35] M. Neubert, “QCD based interpretation of the lepton spectrum in inclusive $B \rightarrow X_u$ lepton anti-neutrino decays,” *Phys. Rev.* **D49**, 3392 (1994) [[arXiv:hep-ph/9311325](#)].
- [36] M. Neubert, “Analysis of the photon spectrum in inclusive $B \rightarrow X_s \gamma$ decays,” *Phys. Rev.* **D49**, 4623 (1994) [[arXiv:hep-ph/9312311](#)].
- [37] T. Mannel and M. Neubert, “Resummation of nonperturbative corrections to the lepton spectrum in inclusive $B \rightarrow X$ lepton anti-neutrino decays,” *Phys. Rev.* **D50**, 2037 (1994) [[arXiv:hep-ph/9402288](#)].
- [38] A. F. Falk, E. Jenkins, A. V. Manohar, and M. B. Wise, “QCD corrections and the endpoint of the lepton spectrum in semileptonic B decays,” *Phys. Rev.* **D49**, 4553 (1994) [[arXiv:hep-ph/9312306](#)].
- [39] M. Gremm, A. Kapustin, Z. Ligeti, and M. B. Wise, “Implications of the $B \rightarrow X \ell \bar{\nu}_\ell$ lepton spectrum for heavy quark theory,” *Phys. Rev. Lett.* **77**, 20 (1996) [[arXiv:hep-ph/9603314](#)].
- [40] A. K. Leibovich, I. Low, and I. Z. Rothstein, “A comment on the extractions of $V(\text{ub})$ from radiative decays,” *Phys. Lett. B* **513**, 83 (2001) [[arXiv:hep-ph/0105066](#)].
- [41] M. Neubert, “Note on the extraction of $|V(\text{ub})|$ using radiative B decays,” *Phys. Lett. B* **513**, 88 (2001) [[arXiv:hep-ph/0104280](#)].
- [42] A. K. Leibovich, I. Low, and I. Z. Rothstein, “Extracting V_{ub} without recourse to structure functions,” *Phys. Rev.* **D61**, 053006 (2000) [[arXiv:hep-ph/9909404](#)].
- [43] T. Mannel and S. Recksiegel, “Comparing $B \rightarrow X_u l \nu_l$ to $B \rightarrow X_s \gamma$ and the determination of $|V_{ub}|/|V_{ts}|$,” *Phys. Rev.* **D60**, 114040 (1999) [[arXiv:hep-ph/9904475](#)].
- [44] V. D. Barger, C. S. Kim, and R. J. N. Phillips, “Hadronic invariant mass discriminates $B \rightarrow U$ contributions in semileptonic B decays,” *Phys. Lett. B* **251**, 629 (1990).
- [45] R. D. Dikeman and N. G. Uraltsev, “Key distributions for charmless semileptonic B decay,” *Nucl. Phys.* **B509**, 378 (1998) [[arXiv:hep-ph/9703437](#)].

- [46] A. F. Falk, Z. Ligeti, and M. B. Wise, “ V_{ub} from the hadronic invariant mass spectrum in semileptonic B decay,” Phys. Lett. **B406**, 225 (1997) [[arXiv:hep-ph/9705235](#)].
- [47] I. Bigi, R. D. Dikeman, and N. Uraltsev, “The hadronic recoil mass spectrum in semileptonic B decays and extracting $|V_{ub}|$ in a model-insensitive way,” Eur. Phys. J. **C4**, 453 (1998) [[arXiv:hep-ph/9706520](#)].
- [48] A. K. Leibovich, I. Low, and I. Z. Rothstein, “Extracting $|V_{ub}|$ from the hadronic mass spectrum of inclusive B decays,” Phys. Lett. **B486**, 86 (2000) [[arXiv:hep-ph/0005124](#)].
- [49] A. K. Leibovich, I. Low, and I. Z. Rothstein, “On the resummed hadronic spectra of inclusive B decays,” Phys. Rev. **D62**, 014010 (2000) [[arXiv:hep-ph/0001028](#)].
- [50] Z. Ligeti, “Theoretical developments in inclusive B decays,” [arXiv:hep-ph/9904460](#).
- [51] C. W. Bauer, Z. Ligeti, and M. Luke, “A model independent determination of $|V_{ub}|$,” Phys. Lett. **B479**, 395 (2000) [[arXiv:hep-ph/0002161](#)].
- [52] C. W. Bauer, Z. Ligeti, and M. Luke, “On $|V_{ub}|$ from the $\bar{B} \rightarrow X_u l \bar{\nu}$ dilepton invariant mass spectrum,” [arXiv:hep-ph/0007054](#).
- [53] M. Neubert, “On the inclusive determination of $|V_{ub}|$ from the lepton invariant mass spectrum,” JHEP **0007**, 022 (2000) [[arXiv:hep-ph/0006068](#)].
- [54] M. Neubert and T. Becher, “Improved determination of $|V(ub)|$ from inclusive semileptonic B-meson decays,” Phys. Lett. B **535**, 127 (2002) [[arXiv:hep-ph/0105217](#)].
- [55] C. W. Bauer, Z. Ligeti, and M. E. Luke, “Precision determination of $|V(ub)|$ from inclusive decays,” Phys. Rev. D **64**, 113004 (2001) [[arXiv:hep-ph/0107074](#)].
- [56] C. W. Bauer, “Present and future in semileptonic B decays,” AIP Conf. Proc. **618**, 123 (2002) [[arXiv:hep-ph/0112243](#)].
- [57] S. W. Bosch, B. O. Lange, M. Neubert, and G. Paz, “Proposal for a precision measurement of $|V(ub)|$,” Phys. Rev. Lett. **93**, 221801 (2004) [[arXiv:hep-ph/0403223](#)].
S. W. Bosch, B. O. Lange, M. Neubert, and G. Paz, “Factorization and shape-function effects in inclusive B-meson decays,” Nucl. Phys. B **699**, 335 (2004) [[arXiv:hep-ph/0402094](#)].
- [58] I. I. Y. Bigi and N. Uraltsev, “A vademecum on quark hadron duality,” Int. J. Mod. Phys. A **16**, 5201 (2001) [[arXiv:hep-ph/0106346](#)].

- [59] M. A. Shifman, “Quark-hadron duality,” [arXiv:hep-ph/0009131](#).
- [60] I. I. Y. Bigi, “The lifetimes of heavy flavour hadrons: A case study in quark hadron duality,” [arXiv:hep-ph/0001003](#).
- [61] B. Chibisov, R. D. Dikeman, M. A. Shifman, and N. Uraltsev, “Operator product expansion, heavy quarks, QCD duality and its violations,” *Int. J. Mod. Phys. A* **12**, 2075 (1997) [[arXiv:hep-ph/9605465](#)].
- [62] I. I. Y. Bigi and N. G. Uraltsev, “Weak annihilation and the endpoint spectrum in semileptonic B decays,” *Nucl. Phys. B* **423**, 33 (1994) [[arXiv:hep-ph/9310285](#)].
- [63] N. Uraltsev, “Theoretical uncertainties in $\Gamma_{sl}(b \rightarrow u)$,” *Int. J. Mod. Phys. A* **14**, 4641 (1999) [[arXiv:hep-ph/9905520](#)].
- [64] M. B. Voloshin, “Nonfactorization effects in heavy mesons and determination of $|V(ub)|$ from inclusive semileptonic B decays,” *Phys. Lett. B* **515**, 74 (2001) [[arXiv:hep-ph/0106040](#)].
- [65] M. B. Voloshin, “Non-factorizable terms, heavy quark masses, and semileptonic decays of D and B mesons,” *Mod. Phys. Lett. A* **17**, 245 (2002) [[arXiv:hep-ph/0202028](#)].
- [66] I. Bigi and N. Uraltsev, “On the expected photon spectrum in $B \rightarrow X + \gamma$ and its uses,” *Int. J. Mod. Phys. A* **17**, 4709 (2002) [[arXiv:hep-ph/0202175](#)].
- [67] C. W. Bauer, M. E. Luke, and T. Mannel, “Light-cone distribution functions for B decays at subleading order in $1/m(b)$,” *Phys. Rev. D* **68**, 094001 (2003) [[arXiv:hep-ph/0102089](#)].
- [68] C. W. Bauer, M. Luke, and T. Mannel, “Subleading shape functions in $B \rightarrow X/u \ell \text{ anti-}\nu$ and the determination of $|V(ub)|$,” *Phys. Lett. B* **543**, 261 (2002) [[arXiv:hep-ph/0205150](#)].
- [69] A. K. Leibovich, Z. Ligeti, and M. B. Wise, “Enhanced subleading structure functions in semileptonic B decay,” *Phys. Lett. B* **539**, 242 (2002) [[arXiv:hep-ph/0205148](#)].
- [70] M. Neubert, “Subleading shape functions and the determination of $|V(ub)|$,” *Phys. Lett. B* **543**, 269 (2002) [[arXiv:hep-ph/0207002](#)].
- [71] C. N. Burrell, M. E. Luke, and A. R. Williamson, “Subleading shape function contributions to the hadronic invariant mass spectrum in $\text{anti-}B \rightarrow X/u \ell \text{ anti-}\nu/\ell$ decay,” *Phys. Rev. D* **69**, 074015 (2004) [[arXiv:hep-ph/0312366](#)].

- [72] M. Luke, “Applications of the heavy quark expansion: $|V(\text{ub})|$ and spectral moments,” eConf **C0304052**, WG107 (2003) [[arXiv:hep-ph/0307378](https://arxiv.org/abs/hep-ph/0307378)].
- [73] Z. Ligeti, “ $|V(\text{cb})|$ and $|V(\text{ub})|$: Theoretical developments,” eConf **C030603**, JEU10 (2003) [[arXiv:hep-ph/0309219](https://arxiv.org/abs/hep-ph/0309219)].
- [74] S. E. Roberts, “Studies of the Hadronic Mass Spectrum from Semileptonic Decays of B Mesons,” University of Rochester Ph.D. thesis, June 1997.
- [75] K. A. Bloom, “Analysis of semileptonic decays of B mesons to D mesons,” Cornell University Ph.D. thesis, 1997.
- [76] V. Boisvert, “A study of exclusive charmless semileptonic B decays with the CLEO detector,” Cornell University Ph.D. thesis, May 2002.
- [77] T. I. Meyer, “A study of neutral B meson time evolution using exclusively reconstructed semileptonic decays,” Stanford University Ph.D. thesis, Aug 2002.
- [78] E. Lipeles, “A study of the fully differential inclusive semileptonic B meson decay rate,” California Institute of Technology Ph.D. thesis, Oct 2003.
- [79] M. Shepherd, Cornell University Ph.D. thesis, expected Spring 2005.
- [80] Y. Kubota *et al.* [CLEO Collaboration], “The CLEO-II detector,” Nucl. Instrum. Meth. A **320**, 66 (1992).
- [81] K. Berkelman, *A Personal History of CESR and CLEO*, World Scientific, 2004.
- [82] T. O. Meyer, “CLEO III Detector Electronics: Design and Commissioning,” CLEO documentation, unpublished.
- [83] R. Brun *et al.*, “GEANT 3.15: Detector description and simulation tool,” CERN Report No. DD/EE/84-1 (1987) (unpublished).
- [84] T. Sjostrand, “The Lund Monte Carlo for jet fragmentation and e^+e^- physics: jetset version 6.2,” Comput. Phys. Commun. **39**, 347 (1986).
T. Sjostrand and M. Bengtsson, “The Lund Monte Carlo for jet fragmentation and e^+e^- physics: jetset version 6.3: an update,” Comput. Phys. Commun. **43**, 367 (1987).
T. Sjostrand, CERN Report No. CERN-TH-6488-92 (unpublished).
- [85] F. James [CN/ASD Group], “MINUIT—Users Guide,” CERN Program Library Long Writeup D506, CERN, 1993.
F. James and M. Winkler, “Minuit Home Page,” <http://www.cern.ch/minuit>.

- [86] A. Ryd and D. Lange, “The EvtGen Event Generator Package,” code and documentation available online at <http://http://hep.ucsb.edu/people/lange/EvtGen/>
- [87] A. Weinstein, “EVCLAS Event Classification,” CLEO CSN 96-347, Feb 1996.
- [88] G. C. Fox and S. Wolfram, “Observables For The Analysis Of Event Shapes In E+ E- Annihilation And Other Processes,” Phys. Rev. Lett. **41**, 1581 (1978).
- [89] B. Valant-Spaight and R. Patterson, “Time of Flight Monte Carlo Improvemets for Recompress Data,” CLEO CBX 98-9, Feb 1998.
- [90] B. Valant-Spaight, B. Berger, K. Ecklund, and R. Patterson, “Slow π^0 Efficiency in Recompress Data,” CLEO CBX 01-16, Mar 2001.
- [91] V. Boisvert, “The Central Detector Recompress and II.V Monte Carlo tuning,” CLEO CBX 98-70, Jan 1999.
- [92] D. Besson, “The Upsilon(4S) Cross-Section at CLEO,” CLEO CBX 92-23, 1992.
D. Besson, “Upsilon(4S) Cross-Section, Reprise,” CLEO CBX 92-75, 1992.
- [93] S. Roberts, L. Gibbons, and E. Thorndike, “Trkman the Next Generation,” CLEO CBX 96-103, Nov 1996.
- [94] T. Riehle, “Recompress Fake Rates,” CLEO CBX Draft, Jun 2000.
- [95] B. Berger, “Tracking Efficincy Studies II: Recompress Results,” CLEO CBX 00-32, Sep 2000.
B. Berger, “Slow Track Embedding Studies I: Prelib Efficiency Results,” CLEO CBX 98-36, Jun 1997.
- [96] G. Altarelli, N. Cabibbo, G. Corbo, L. Maiani, and G. Martinelli, “Leptonic Decay Of Heavy Flavors: A Theoretical Update,” Nucl. Phys. B **208**, 365 (1982).
- [97] M. Jezabek and J. H. Kuhn, “Lepton Spectra From Heavy Quark Decay,” Nucl. Phys. B **320**, 20 (1989).
- [98] F. De Fazio and M. Neubert, “ $B \rightarrow X_u l \bar{\nu}_l$ decay distributions to order α_s ,” JHEP **9906**, 017 (1999) [[arXiv:hep-ph/9905351](https://arxiv.org/abs/hep-ph/9905351)].
- [99] A. Lyon and E. Thorndike, “A subroutine that calculates the triply-differential decay rate $d^3\Gamma/dE_\ell dq^2 ds_H$ for the inclusive $b \rightarrow u \ell \nu$ decay $B \rightarrow X_u \ell \nu$,” CLEO CBX 02-3, Feb 2002.

- [100] A. Lyon, D. Cronin-Hennessy, J. Ernst, J. Thayer, and E. Thorndike, “Improving the determination of V_{ub} using the $b \rightarrow s\gamma$ photon energy spectrum,” CLEO CBX 01-59, Jan 2002.
- [101] X. Zhao and A. Bean, “The study of partial reconstruction of $B^- \rightarrow \bar{p}e^- \bar{\nu}_e X$ decay,” CLEO CBX 01-41, Apr 2002.
- [102] M. Shepherd, private communication.
- [103] M. Shepherd, private communication.
- [104] V. Boisvert, private communication.
- [105] C. Park, “SPLITF Issues,” internal CLEO analysis group note, Apr 2001.
- [106] C. Park, “Some Thoughts on an a $b \rightarrow u \ell \nu$ Inclusive Design Study,” internal CLEO analysis group note, Aug 2001.
- [107] C. Park, “CLEO III Rochester Electron Identification (REId),” CLEO CBX Draft v1.3, Apr 2003.
- [108] C. H. Wang, “Electron Identification With CLEO II,” CLEO CBX 91-52, 1991.
- [109] E. H. Thorndike, private communication.
- [110] E. H. Thorndike, private communication.
- [111] A. Warburton, private communication.
This study involved a comparison between data and Monte Carlo of the average K_S multiplicity in $B\bar{B}$ events. The discrepancy is assumed to apply equally to K_L 's. The values used in this work are the same as those applied in other recent analyses, *e.g.* Boisvert and Shepherd's theses [76, 79].
- [112] L. Gibbons, private communication.
- [113] A. Warburton, private communication.
- [114] Z. Ligeti, private communication.
- [115] D. Cinabro, private communication. This undocumented study examined the energy deposition from K^+ in the calorimeter.
- [116] W. Park and E. H. Thorndike, “ K_L^0 Study for $b \rightarrow s\gamma$,” CLEO CBX 03-25, Jul 2003.
- [117] D. Scora and N. Isgur, “Semileptonic meson decays in the quark model: An update,” Phys. Rev. D **52**, 2783 (1995) [[arXiv:hep-ph/9503486](https://arxiv.org/abs/hep-ph/9503486)].

- [118] I. Caprini and M. Neubert, “Improved Bounds for the Slope and Curvature of $\bar{B} \rightarrow D (*)\ell\bar{\nu}$ Form Factors,” *Phys. Lett. B* **380**, 376 (1996) [[arXiv:hep-ph/9603414](#)].
- [119] R. M. Baltrusaitis *et al.* [MARK-III Collaboration], “A Direct Measurement Of Charmed D+ And D0 Semileptonic Branching Ratios,” *Phys. Rev. Lett.* **54**, 1976 (1985) [Erratum-*ibid.* **55**, 638 (1985)].
- [120] C. Park, private communication.
- [121] L. Gibbons *et al.* [CLEO Collaboration], “The inclusive decays $B \rightarrow D X$ and $B \rightarrow D^* X$,” *Phys. Rev. D* **56**, 3783 (1997) [[arXiv:hep-ex/9703006](#)].
- [122] J. E. Duboscq *et al.* [CLEO Collaboration], “Measurement of the form-factors for anti-B0 $\rightarrow D^*+$ lepton- anti-neutrino,” *Phys. Rev. Lett.* **76**, 3898 (1996).
- [123] R. Fulton *et al.* [CLEO Collaboration], “Observation of B-meson semileptonic decays to non-charmed CLEO final states,” *Phys. Lett.* **64**, 16 (1990).
J. Bartelt *et al.* [CLEO Collaboration], “Measurement of charmless semileptonic decays of B mesons,” *Phys. Rev. Lett.* **71**, 4111 (1993).
- [124] H. Albrecht *et al.* [ARGUS Collaboration], “Observation Of Semileptonic Charmless B Meson Decays,” *Phys. Lett. B* **234**, 409 (1990).
H. Albrecht *et al.* [ARGUS Collaboration], “Reconstruction of semileptonic $b \rightarrow u$ decays,” *Phys. Lett.* **B255**, 297 (1991).
- [125] G. Abbiendi *et al.* [OPAL Collaboration], “Measurement of $|V_{ub}|$ using b hadron semileptonic decay,” *Eur. Phys. J. C* **21**, 399 (2001) [[arXiv:hep-ex/0107016](#)].
- [126] B. Aubert *et al.* [BABAR Collaboration], “Study of $b \rightarrow u l \bar{\nu}$ decays on the recoil of fully reconstructed B mesons and determination of $|V(ub)|$,” Contribution to ICHEP04, [arXiv:hep-ex/0408068](#).
- [127] M. S. Alam *et al.* [CLEO Collaboration], “First measurement of the rate for the inclusive radiative penguin decay $b \rightarrow s \gamma$,” *Phys. Rev. Lett.* **74**, 2885 (1995).
- [128] A. Bornheim *et al.* [CLEO Collaboration], “Improved measurement of $|V(ub)|$ with inclusive semileptonic B decays,” *Phys. Rev. Lett.* **88**, 231803 (2002) [[arXiv:hep-ex/0202019](#)].
- [129] B. Aubert *et al.* [BaBar Collaboration], “Measurement of the inclusive electron spectrum in charmless semileptonic B decays near the kinematic endpoint and determination of $|V(ub)|$,” Contribution to ICHEP04, [arXiv:hep-ex/0408075](#).

- B. Aubert *et al.* [BaBar Collaboration], “Measurement of the inclusive electron spectrum in charmless semileptonic B decays near the kinematic endpoint,” Contribution to ICHEP02, [arXiv:hep-ex/0207081](#).
- [130] K. Abe *et al.* [Belle Collaboration], “Measurement of inclusive charmless semileptonic B decays at the endpoint of the electron momentum spectrum,” Contribution to EPS03, BELLE-CONF-0325, July 2003.
- [131] B. Aubert *et al.* [BaBar Collaboration], “Measurement of the inclusive charmless semileptonic branching ratio of B mesons and determination of $|V(ub)|$,” Phys. Rev. Lett. **92**, 071802 (2004) [[arXiv:hep-ex/0307062](#)].
- [132] C. Schwanda for the Belle Collaboration, Contribution to EPS03 Proceedings (Aachen, Germany), July 2003.
- [133] K. Abe *et al.* [Belle Collaboration], “Measurement of the inclusive charmless semileptonic branching fraction of B meson using the full reconstruction tag,” Contribution to ICHEP04, [arXiv:hep-ex/0408115](#).
H. Kakuno *et al.* [Belle Collaboration], “Measurement of $|V_{ub}|$ using inclusive $B \rightarrow X_u \ell \nu$ decays with a novel X_u -reconstruction method,” Phys. Rev. Lett. **92**, 101801 (2004) [[arXiv:hep-ex/0311048](#)].

INDEX

- B
 - meson, 2, 77
 - semileptonic decay, 22
- B factories, 54, 73, 79, 251, 254
- Λ_{QCD} , 34
- Υ resonances, 78
- $\Upsilon(4S)$, 79
- λ_1 , 39
- λ_2 , 39
- $\bar{\Lambda}$, 40

- background subtraction, 117
- balls in urn, 186
- bosons, 12
- $b \rightarrow s\gamma$, 52, 56
- bsghi/lo, 123
- bump, 214

- calorimeter
 - crystal, *see* CC
 - electromagnetic, 99
 - hadronic, 100
- cascade leptons, *see* sec. leptons
- CC, 96
 - clustering, 101
 - performance, 100
 - readout, 100
- CCHAD, 108, 116
- CESR, 4, 80
- CKM matrix, 18
- CLEO, 85
 - coordinates, 88
- CLEO-c, 83, 131, 252
- CLEO II, 87
- CLEO II.V, 87, 105
- CLEO III, 106
- confinement, 2
- continuum, 117
 - Fisher, 166
 - subtraction, 169
 - suppression, 164
- CP violation, 1, 8, 20

- crossing angle, 133
- crystals, *see* CC
- curlers, 94, 140
- CUSB, 82

- DAQ, 104
- datasets, 109
- decays in flight, 141
- dE/dx , 93
- dilepton mass, *see* q^2
- displaced vertex, 135
- DR2, 92
- drift cell, 90
- drift chambers, 89, *see* DR2

- E/p , 157
- e^+e^-
 - annihilation, 76
- effective theory, 15
- efficiency, 155
- electron identification, 157
- event reconstruction, 108
- event selection, 170

- fake leptons, 180
 - signal, 181
 - veto, 183
- fake rate, 155
- fermions, 1
- fit, 205
 - χ^2 , 208
 - bins, 207
 - bump, 214
 - parameters, 209
 - yield, 210
- flavor change, 1, 18
- form factor, 24
- fundamental interactions, 12

- gauge invariance, 13
- ghost pairs, 141
- Gibbons, L., iv, viii, 73, 249, 271, 273, 295

- gravity, 12
- hadronic mass, 178
- hadronic matrix elements, 33, 39
- heavy quark eff. theory, *see* HQET
- heavy quark expansion, 36
- heavy quark fields, 37
- heavy quark symmetry, 35
- HQET, 3, 34
 - intuition, 34
 - parameters, 39
- impact ratio, 221
- impurity, 155
- InclGen, 5, 113, 121, 253
- inclusive, 3, 25, 41
- Kalman, 94
- K_L , 188, 227, 233
- knob turn, 225
- K_S , 135
- L0, 103
- lattice QCD, 25, 33, 69, 252
- leptons, 1, 10
 - counting, 155
 - fake, *see* fake leptons
 - identification, 154
 - quality cuts, 156
 - signal, 155, 161
 - simulation, 163
 - veto, 155
- lepton endpoint, 27
- lepton identification, 154
- light-cone distribution function, 50
- linac, 80
- luminosity, 84
- missing mass, 134
- MM^2 , 134
- Monte Carlo, 5, 109
 - $b \rightarrow c \ell \nu$, 113, 118
 - $b \rightarrow u \ell \nu$, 121
 - definition, 110
 - WA, 124, 196
- Mt. Pleasant, 144
- MU, 101
- muon chambers, *see* MU
- muon identification, 159
- net charge, 129, 141
- neutrino
 - consistency checks, 134
 - efficiency, 172
 - error matrix, 134
 - four-vector, 135
 - resolution, 148
- neutrino reconstruction, 4, 126
- newbsg**, 123
- ON- α OFF-subtraction, 170
- OPE, 31
- operator product expansion, *see* OPE
- parametric plot, 214
- particle identification, 146
- pass2, 108
- pedestal, 105
- PID, *see* particle identification
 - systematics, 230
- pretzel orbit, 82
- production fractions, 148
- PT, 92
- purity, 155
- q^2 , 175
 - definition, 22
 - efficiency, 176
 - resolution, 175
- QCD factorization, 68, 252
- QHD, *see* quark-hadron duality
- QQ, 112
- quantum numbers, 13
- quark
 - confinement, 2, 31, 78
 - mixing, 1, 18
 - spectator, 2
- quark-hadron duality, 25, 41, 43, 63, 64
 - forecast, 66

- global, 65
- local, 65
- quarks, 1, 10
- $R2$, 165
- re-weight, 185
 - B to baryons, 193
 - $D^* \ell \nu$, 192
 - K_L , 188
 - $b \rightarrow c$ branching fractions, 193
 - secondary leptons, 189
- remarkable relation, 53
- renormalization schemes, 33
- RF cavities, 83
- scale, 15
- SCET, 62
- secondary leptons, 189, 233
- shape function, 49
 - $b \rightarrow s\gamma$, 52
 - moments, 50
 - sub-leading corrections, 64, 69
- showers
 - efficiency, 228
 - resolution, 228
 - selection, 142
 - systematics, 227
- silicon detector, *see* SV
- skim, 108
- soft gluons, 2, 23
- sparsification, 105
- special relativity, 86
- specific ionization, 93
- S'_\perp , 166
- Splitoff*, 144, 271
- splitoff showers, 143
- splitoff systematics, 227, 228
- Standard Model, 10
 - parameters, 14
- Sufi mondo, 62
- SV, 105
- synchrotron, 81
- synchrotron radiation, 82
- τ pairs, 172
- TF, 95, *see* TOF
- time-of-flight, *see* TOF
- track-shower matching, 142, 143
- tracking, 89
- tracks
 - efficiency, 229
 - resolution, 230
 - selection, 139
 - systematics, 229
- trigger, 103
- Trkman, 140
- unitarity triangle, 20
- v -ratio, 134
- VD, 92
- v_{miss} , 134
- $|V_{ub}|$, 2, 19, 44
 - q^2 and M_X cuts, 60
 - dilepton mass cut, 46, 57
 - hadronic mass cut, 46, 55
 - lepton endpoint, 46
- V_{ub} , *see* $|V_{ub}|$
- WA, *see* weak annihilation
- weak annihilation, 3, 9, 64, 67
 - limits, 245
 - model, 197
 - Monte Carlo, 124
 - parameters, 197
 - pdf, 197
 - picture, 196
 - samples, 199
- wees, 141
- Wilson coefficients, 32, 39
- x0/hi/1o, 124

This is the end.

Welcome.