

Bibliography

- [1] J. J. Thomson, *Phil. Mag.* **44**, 293 (1897);
J. J. Thomson, *Nature* **55**, 453 (1897).
- [2] S.L. Glashow, *Nucl. Phys.* **22**, 579 (1961);
S. Weinberg, *Phys. Rev. Lett.* **19**, 1264 (1967);
A. Salam, *Elementary Particle Theory*, Ed. N. Svartholm *et al.*, 367 (1968).
- [3] P.W. Higgs, *Phys. Lett.* **12**, 132 (1964);
P.W. Higgs, *Phys. Rev. Lett.* **13**, 508 (1964);
P.W. Higgs, *Phys. Rev.* **145**, 1156 (1966).
- [4] H. Fritzsch, M. Gell-Mann, and H. Leutwyler, *Phys. Lett.* **B 47**, 365 (1973);
D.J. Gross and F. Wilczek, *Phys. Rev.* **D 8**, 3633 (1973).
- [5] G. 't Hooft, *Nucl. Phys.* **B 33**, 173 (1971);
G. 't Hooft, *Nucl. Phys.* **B 35**, 167 (1971).
- [6] Particle Data Group, S. Eidelman *et al.*, *Phys. Lett.* **B 592**, 1 (2004).
- [7] CDF Collab., F. Abe *et al.*, *Phys. Rev.* **D 50**, 2966 (1994);
CDF Collab., F. Abe *et al.*, *Phys. Rev. Lett.* **74**, 2626 (1995);
DØ Collab., S. Abachi *et al.*, *Phys. Rev. Lett.* **74**, 2632 (1995).
- [8] DONuT Collab., K. Kodama *et al.*, *Phys. Lett.* **B 504**, 218 (2001).
- [9] L3 Experiment, <http://l3.web.cern.ch/l3/>.
- [10] LEP Electroweak Working Group,
The current results can be found at <http://lepewwg.web.cern.ch/LEPEWWG/>

- LEP Collaborations, *A Combination of Preliminary Electroweak Measurements and Constraints on the Standard Model*, arXiv:hep-ex/0412015 (2004).
- [11] LEP Collaborations, *Search for the Standard Model Higgs Boson at LEP*, Phys. Lett. **B 565**, 61 (2003).
- [12] For recent reviews see, e.g.:
E. Roulet, *Beyond the Standard Model*, arXiv:hep-ph/0112348 (2001); C. Quigg, *Beyond the Standard Model in Many Directions*, arXiv:hep-ph/0404228 (2004); G. Altarelli, *The Electroweak Interactions in the Standard Model and Beyond*, arXiv:hep-ph/0406270 (2004).
- [13] Super-Kamiokande Collab., S. Fukuda *et al.*, Phys. Rev. Lett. **85**, 3999 (2000); Y. Fukuda *et al.*, Phys. Rev. Lett. **81**, 1562 (1998);
SNO Collab., Q.R. Ahmad *et al.*, Phys. Rev. Lett. **89**, 011301 (2002);
SNO Collab., Q.R. Ahmad *et al.*, Phys. Rev. Lett. **89**, 011302 (2002);
KamLAND Collab., K. Eguchi *et al.*, Phys. Rev. Lett. **90**, 021802 (2003).
- [14] For recent reviews see, e.g.:
C. Giunti, *Status of Neutrino Masses and Mixing*, hep-ph/0309024 (2003);
K. Scholberg, *Neutrino Physics: Status and Prospects*, hep-ex/0308011 (2003);
H. Murayama, *Theoretical Neutrino Physics*, Eur. Phys. J. **C 33**, DOI 10.1140/epjcd/s2004-03-1697-8, (2004).
- [15] A. Straessner, *Measurement of the W Boson Mass at LEP*, arXiv:hep-ex/0405005 (2004).
- [16] Z. Berezhiani and A. Rossi, Phys. Lett. **B 535**, 207 (2002).
- [17] KKMC version 4.19 is used:
S. Jadach, B.F.L. Ward, and Z. Was, Comput. Phys. Commun. **130**, 260 (2000).
- [18] C. Mana, M. Martinez, and R. Miquel, *Radiative Corrections To The Neutrino Counting Experiment*, UAB-LFAE-89-07, Talk given at Ann Arbor Workshop

- on QED Structure Functions, May 22-25, 1989;
ALEPH Collab., R. Barate *et al.*, Phys. Lett. **B 445**, 239 (1998).
- [19] S. M. Bilenky, *Neutrinos*, arXiv:physics/0103091 (2001);
M. Shaevitz, *Neutrino Physics, Masses, and Oscillations*, in Proceedings of the
16th Lake Louise Winter Institute on Fundamental Interactions, 2002.
- [20] G. Bonneau and F. Martin, Nucl. Phys. **B 27**, 381 (1971);
F. A. Berends and R. Kleiss, Nucl. Phys. **B 260**, 32 (1985);
O. Nicrosini and L. Trentadue, Nucl. Phys. **B 318**, 1 (1989);
M.E. Peskin, D.V. Schroeder, *An Introduction to Quantum Field Theory*,
Addison-Wesley, 1995, pp. 173-174.
- [21] G. Montagna *et al.*, Nucl. Phys. **B 452**, 161 (1995).
- [22] KORALZ version 4.04 is used:
S. Jadach, B.F.L. Ward, and Z. Was, Comput. Phys. Commun. **79**, 503 (1994);
S. Jadach, B.F.L. Ward, and Z. Was, Comput. Phys. Commun. **124**, 233 (2000).
- [23] Z. Was, private communication (2003).
- [24] D.Y. Bardin *et al.*, Eur. Phys. J. **C 24**, 373 (2002).
- [25] S. Jadach, B.F.L. Ward, and Z. Was, Phys. Rev. **D 63** (2001) 113009.
- [26] D.Y. Bardin *et al.*, Comput. Phys. Commun. **59**, 303 (1990).
- [27] NUNUGPV version 2.0 is used:
G. Montagna *et al.*, Nucl. Phys. **B 541**, 31 (1999);
G. Montagna, O. Nicrosini, and F. Piccinini, Comput. Phys. Commun. **98**, 206
(1996).
- [28] Two-Fermion Working Group, M. Kobel *et al.*, arXiv:hep-ph/0007180 (2000).
- [29] P.A.M. Dirac, Proc. Roy. Soc. Lond. **A 117**, 610 (1928).
- [30] C.D. Anderson, Phys. Rev. **43**, 491 (1933).

- [31] A review can be found for example in:
H.E. Haber and G.L. Kane, Phys. Rep. **117**, 75 (1985).
- [32] R. Haag, J.T. Lopuszanski, and M. Sohnius, Nucl. Phys. **B 88**, 257 (1975).
- [33] G. 't Hooft, in: G. 't Hooft *et al.*, eds., *Recent Developments in Field Theories*, Plenum Press, New York, 1980;
E. Witten, Nucl. Phys. **B 188**, 513 (1981);
R.K. Kaul, Phys. Lett. **B 109**, 19 (1982).
- [34] J. R. Ellis, *Supersymmetry for Alp Hikers*, arXiv:hep-ph/0203114 (2002).
- [35] U. Amaldi, W. de Boer, and H. Furstenau, Phys. Lett. **B 260**, 447 (1991).
- [36] P. Fayet, Nucl. Phys. **B 90**, 104 (1975);
A. Salam and J. Strathdee, Nucl. Phys. **B 87**, 85 (1975).
- [37] J. Ellis *et al.*, Nucl. Phys. **B 238**, 453 (1984).
- [38] S. P. Martin, *A Supersymmetry Primer*, arXiv:hep-ph/9709356 (1997).
- [39] G. Jungman, M Kamionkowski, and K. Griest, Phys. Reports **267**, 195 (1996).
- [40] A.R. Liddle and D.H. Lyth, Phys. Reports **213**, 1 (1993).
- [41] C.L. Bennett *et al.*, Astrophys. J. Suppl. **148**, 1 (2003).
- [42] P. Gondolo, *Non-baryonic Dark Matter*, arXiv:astro-ph/0403064 (2004);
A.B. Lahanas, N.E. Mavromatos, and D.V. Nanopoulos, Int. J. Mod. Phys. **D 12**, 1529 (2003); V. Sahni, *Dark Matter and Dark Energy*, arXiv:astro-ph/0403324 (2003).
- [43] J.F. Gunion, H.E. Haber, G. Kane, and S. Dawson, *The Higgs Hunter's Guide*, Frontiers in Physics **vol. 80**, Addison-Wesley, 1990.
- [44] S.L. Glashow and S. Weinberg, Phys. Rev. **D 15**, 1958 (1977).
- [45] S. Dawson, *The MSSM and Why It Works*, arXiv:hep-ph/9712464 (1997).

- [46] K. Inoue *et al.*, Prog. Theor. Phys. **67**, 1889 (1982);
R. A. Flores and M. Sher, Annals Phys. **148**, 95 (1983);
J. F. Gunion and H.E. Haber, Nucl. Phys. **B 272**, 1 (1986) [Erratum-ibid. **B 402**, 567 (1993)].
- [47] G. Degrossi *et al.*, Eur. Phys. J. **C 28**, 133 (2003).
- [48] M. E. Peskin, *Beyond the Standard Model*, arXiv:hep-ph/9705479 (1997).
- [49] J. Goldstone, Nuovo Cim. **19**, 154 (1961);
J. Goldstone, A. Salam, and S. Weinberg, Phys. Rev. **127**, 965 (1962).
- [50] P. Fayet, Phys. Lett. **B 84**, 421 (1979);
P. Fayet, Phys. Lett. **B 86**, 272 (1979).
- [51] S. Dreser and B. Zumino, Phys. Rev. Lett. **38**, 1433 (1977);
D.V. Volkov and V.A. Soroka, JETP Lett. **18**, 312 (1973).
- [52] L.J. Hall, J. Lykken, and S. Weinberg, Phys. Rev. **D 27**, 2359 (1983).
- [53] S.K. Soni and H.A. Weldon, Phys. Lett. **B 126**, 215 (1983);
Y. Kawamura, H. Murayama, and M. Yamaguchi, Phys. Rev. **D 51**, 1337 (1995).
- [54] L.E. Ibanez, Phys. Lett. **B 118**, 73 (1982);
L.E. Ibanez and G.G. Ross, Phys. Lett. **B 110**, 215 (1982);
J.R. Ellis, D.V. Nanopoulos, and K. Tamvakis, Phys. Lett. **B 121**, 123 (1983);
J.R. Ellis *et al.*, Phys. Lett. **B 125**, 275 (1983);
L. Alvarez-Gaume, J. Polchinski, and M.B. Wise, Nucl. Phys. **B 221**, 495 (1983).
- [55] M. Dine and A.E. Nelson, Phys. Rev. **D 48**, 1277 (1993);
M. Dine, A.E. Nelson, and Y. Shirman, Phys. Rev. **D 51**, 1362 (1995);
M. Dine *et al.*, Phys. Rev. **D 53**, 2658 (1996).
- [56] G. F. Giudice and R. Rattazzi, Phys. Rept. **322**, 419 (1999).

- [57] J.A. Bagger *et al.*, Phys. Rev. Lett. **78**, 1002 (1997);
S. Dimopoulos, S. Thomas, and J.D. Wells, Nucl. Phys. **B 488**, 39 (1997).
- [58] D. Ruschmeier, *Search for New Physics in Electron-Positron Interactions with Photons in the Final State*, Ph.D. thesis, Humboldt University, 1999.
- [59] H. Baer *et al.*, *Simulating Supersymmetry with ISAJET 7.0 / ISASUSY 1.0*, arXiv:hep-ph/9305342 (1993).
- [60] S. Ambrosanio *et al.*, Phys. Rev. **D 54**, 5395 (1996).
- [61] J.A. Bagger *et al.*, Phys. Rev. **D 55**, 3188 (1997).
- [62] A. Bartl, H. Fraas, and W. Majerotto, Nucl. Phys. **B 278**, 1 (1986);
S. Ambrosanio and B. Mele, Phys. Rev. **D 52**, 3900 (1995).
- [63] J.R. Ellis and J.S. Hagelin, Phys. Lett. **B 122**, 303 (1983).
- [64] J.H. Dann, *A Study of Single and Multi-Photon Events in e^+e^- Collisions at Center-of-Mass Energies of 161 GeV and 172 GeV*, Ph.D. thesis, UC Santa Cruz, 1998.
- [65] S. Ambrosanio, G.D. Kribs, and S.P. Martin, Phys. Rev. **D 56**, 1761 (1997).
- [66] SUSYGEN version 2.20 is used:
S. Katsanevas and P. Morawitz, Comp. Phys. Comm. **112**, 227 (1998).
- [67] CDF Collab., F. Abe *et al.*, Phys. Rev. Lett. **81**, 1791 (1998).
- [68] J.L. Lopez and D.V. Nanopoulos, Phys. Rev. **D 55**, 4450 (1997).
- [69] S. Ambrosanio *et al.*, Phys. Rev. **D 55**, 1372 (1997).
- [70] S. Ambrosanio and B. Mele, Phys. Rev. **D 55**, 1399 (1997);
H. Baer and T. Krupovnickas, JHEP **0209**, 038 (2002).

- [71] E. Cremmer *et al.*, Phys. Lett. **B 133**, 61 (1983);
J. Ellis *et al.*, Nucl. Phys. **B 241**, 406 (1984);
J. Ellis *et al.*, Nucl. Phys. **B 247**, 373 (1984).
- [72] A. Brignole, F. Feruglio, and F. Zwirner, Nucl. Phys. **B 516**, 13 (1998).
- [73] J.L. Lopez, D.V. Nanopoulos, and A. Zichichi, Phys. Rev. **D 49**, 343 (1994);
J.L. Lopez, D.V. Nanopoulos, and A. Zichichi, Int. J. Mod. Phys. **A 10**, 4241 (1995).
- [74] J.R. Ellis, J.L. Lopez, and D. V. Nanopoulos, Phys. Lett. **B 394**, 354 (1997).
- [75] I. Antoniadis *et al.*, Phys. Lett. **B 194**, 231 (1987);
J. Ellis *et al.*, Nucl. Phys. **B 311**, 1 (1989).
- [76] P. Fayet, Phys. Lett. **B 117**, 460 (1982);
O. Nachtmann, A. Reiter, and M. Wirbel, Z. Phys. **C 27**, 577 (1985);
A. Brignole, F. Feruglio, and F. Zwirner, Nucl. Phys. **B 501**, 332 (1997).
- [77] N. Arkani-Hamed, S. Dimopoulos, and G.R. Dvali, Phys. Lett. **B 429**, 263 (1998); I. Antoniadis, N. Arkani-Hamed, S. Dimopoulos, and G.R. Dvali, Phys. Lett. **B 436**, 257 (1998); N. Arkani-Hamed, S. Dimopoulos, and G.R. Dvali, Phys. Rev. **D 59**, 086004 (1999).
- [78] For recent reviews see, e.g.:
J. Hewett and M. Spiropulu, Ann. Rev. Nucl. Part. Sci. **52**, 397 (2002);
F. Feruglio, Eur. Phys. J. **C 33**, S114 (2004), hep-ph/0401033;
S. Mele, Eur. Phys. J. **C 33**, S919 (2004).
- [79] J.C. Long and J.C. Price, Comptes Rendus Physique **4**, 337 (2003).
- [80] G.F. Giudice, R. Rattazzi, and J.D. Wells, Nucl. Phys. **B 544**, 3 (1999).
- [81] E. Mirabelli, M. Perelstein, and M.E. Peskin, Phys. Rev. Lett. **82**, 2236 (1999);
T. Han, J.D. Lykken, and R.J. Zhang, Phys. Rev. **D 59**, 105006 (1999).

- [82] R. Sundrum, *Phys. Rev. D* **59**, 085009 (1999);
A. Dobado and A.L. Maroto, *Nucl. Phys. B* **592**, 203 (2001).
- [83] J.A.R. Cembranos, A. Dobado, and A.L. Maroto, *Phys. Rev. Lett.* **90**, 241301 (2003); J.A.R. Cembranos, A. Dobado, and A.L. Maroto, *Phys. Rev. D* **68**, 103505 (2003).
- [84] J. Alcaraz *et al.*, *Phys. Rev. D* **67**, 075010 (2003).
- [85] M. Bando *et al.*, *Phys. Rev. Lett.* **83**, 3601 (1999).
- [86] D. Brandt *et al.*, *Rep. Prog. Phys.* **63**, 939 (2000).
- [87] L3 Collab., B. Adeva *et al.*, *Nucl. Inst. Meth. A* **289**, 35 (1990).
- [88] ALEPH Collab., D. Decamp *et al.*, *Nucl. Instrum. Meth. A* **294**, 121 (1990).
- [89] OPAL Collab., K. Ahmet *et al.*, *Nucl. Instrum. Meth. A* **305**, 275 (1991).
- [90] DELPHI Collab., P. Aarnio *et al.*, *Nucl. Instrum. Meth. A* **303**, 233 (1990).
- [91] LEP Design Report, **Vol. 1**, *The LEP Injector Chain*, CERN-LEP/TH/83-29, CERN, (1983).
- [92] UA1 Collab., G. Arnison *et al.*, *Phys. Lett. B* **122**, 103 (1983).
- [93] UA2 Collab., M. Banner *et al.*, *Phys. Lett. B* **122**, 476 (1983).
- [94] K. Schindl, *The Injector Chain for the LHC*, in Proceedings of the 9th LEP-SPS Performance Workshop, Chamonix, France, ed. J. Poole, CERN/PS 99-018.
- [95] LEP Collaborations, CERN-EP/2000-153, arXiv:hep-ex/0101027 (2000).
- [96] R.W. Assmann, *LEP Operation and Performance with Electron-Positron Collisions at 209 GeV*, in Proceedings of 11th LEP-SPS Performance Workshop, Chamonix, France, CERN-SL-2001-003-DI.

- [97] P. Brown *et al.*, *Ultimate Performance of the LEP RF System*, in Proceedings of IEEE Particle Accelerator Conference, Chicago, USA, CERN-SL-2001-018-HRF.
- [98] L. Arnaudon *et al.*, Phys. Lett. **B 284**, 431 (1992).
- [99] LEP Energy Working Group, R. Assmann *et al.*, Eur. Phys. J. **C 6**, 187 (1999).
- [100] A.A. Sokolov and I.M. Ternov, Dokl. Akad. Nauk. SSSR **153**, 1052 (1963).
- [101] J. Prochnow, *The LEP Energy Spectrometer*, Diploma thesis, RWTH Aachen, 2000, PITHA 00/10.
- [102] P. B. Renton, *Measurement of the Beam Energy at LEP 2*, in Proceedings of ICHEP 2000, Osaka, Japan, **Vol. 1** 687.
- [103] LEP Energy Working Group, R. Assmann *et al.*, Eur. Phys. J. **C 39**, 253 (2005).
- [104] ALICE Experiment, CERN/LHCC/96-71 (1996),
<http://alice.web.cern.ch/Alice>
- [105] A. P. Colijn, *Measurement of the Tau Lepton Lifetime*, Ph.D. thesis, NIKHEF, 1999.
- [106] H. Anderhub *et al.*, Nucl. Instrum. Meth. **A 515**, 31 (2003).
- [107] M. Acciari *et al.*, Nucl. Instrum. Meth. **A 351**, 300 (1994).
- [108] R. Wigmans, *Calorimetry Energy Measurement in Particle Physics*, Clarendon Press, Oxford, 2000, pp. 26-109.
- [109] J.A. Bakken *et al.*, Nucl. Instrum. Meth. **A 275**, 81 (1989).
- [110] C. Tully, *Baryon Production in Z decay*, Ph.D. thesis, Princeton University, 1997.
- [111] ALEPH Collab., A. Heister *et al.*, Eur. Phys. J. **C 28**, 1 (2003).

- [112] P. Huntmeyer, *A Determination of the Electroweak Quark Couplings using Final State Photon Emission in Z Decays*, Ph. D. thesis, University of Hamburg, 2001.
- [113] DELPHI Collab., P. Abreu *et al.*, *Eur. Phys. J. C* **17**, 53 (2000).
- [114] G. Bastl *et al.*, *Nucl. Instrum. Meth. A* **374**, 293 (1996).
- [115] S. Laplace, *Bhabha Event Selection in the EGAP Detector*, L3 Note 2813, September 1998.
- [116] U. Uwer, *The L3 Scintillation Counter System: Description and Status*, L3 Note 2003, November 1997.
- [117] O. Adriani *et al.*, *Nucl. Instrum. Meth. A* **300**, 493 (1991).
- [118] A. Robohm, *Measurement of the Muon Pair Production with the L3 Experiment*, Ph.D. thesis, ETH Zurich, 1998.
- [119] M. Chemarin *et al.*, *Nucl. Instrum. Meth. A* **349**, 345 (1994).
- [120] G. Grenier, *Recherche de Particules Supersymétriques à l'aide de Photons avec le Détecteur L3 à LEP200*, Ph.D. thesis, University of Lyon, 2000.
- [121] B.F.L. Ward *et al.*, *Phys. Lett. B* **450**, 262 (1999).
- [122] I.C. Brock *et al.*, *Nucl. Instrum. Meth. A* **381**, 236 (1996).
- [123] R. Bagnaia *et al.*, *Nucl. Instrum. Meth. A* **324**, 101 (1993);
Y. Bertsch *et al.*, *Nucl. Instrum. Meth. A* **340**, 309 (1994);
S.P. Beingessner *et al.*, *Nucl. Instrum. Meth. A* **340**, 322 (1994).
- [124] C. Luci, *DAQ and Trigger Status Report*, L3 Note 2616a, September 2000.
- [125] R. Bizzarri *et al.*, *Nucl. Instrum. Meth. A* **317**, 463 (1992).

- [126] F. James, *Monte Carlo Theory and Practice*, in *Experimental Techniques in High Energy Physics*, ed. T. Ferbel, Addison-Wesley Publishing Company Inc., 1987, pp. 627-677.
- [127] R. Brun *et al.*, GEANT3, CERN-DD/EE/84-1 (Revised), 1987.
- [128] L3 Collab., *The Construction of L3*, April 1985.
- [129] L3 Collab., M. Acciarri *et al.*, Phys. Lett. **B 407**, 351 (1997).
- [130] J.A. Bakken *et al.*, Nucl. Instrum. Meth. **A 254**, 535 (1987);
J.A. Bakken *et al.*, Nucl. Instrum. Meth. **A 280**, 25 (1989).
- [131] J.A. Bakken *et al.*, *Calibration of the L3 Electromagnetic Calorimeter in Electron Beam*, L3 Note 1712, March 1995.
- [132] M. Merk, *Study of Bhabha Scattering at the Z^0 -Resonance using the L3 Detector*, Ph.D. thesis, University of Nijmegen, 1992.
- [133] C.W. Fabjan and F. Gianotti, Rev. Mod. Phys. **75**, 1243 (2003).
- [134] Y. Karyotakis, *The L3 Electromagnetic Calorimeter*, LAPP-EXP-95.02, Contributed to 1994 Beijing Calorimetry Symposium.
- [135] P. Deglon, *Etude de la diffusion Bhabha avec le Détecteur L3 au LEP*, Ph.D. thesis, University of Geneva, 2002.
- [136] C. Green, *An Investigation into the Temperature Fitting and Correction System for the BGO Calorimeter*, L3 note 1677, November 1994.
- [137] J. Fay, *The L3 Electromagnetic Calorimeter*, in Proceedings of CALOR 1999, Lisbon, Portugal, 212.
- [138] A. Bay *et al.*, Nucl. Instrum. Meth. **A 321**, 119 (1992).
- [139] J. Wenninger, *Mesure de Paramètres Électro-faibles du Z^0 avec la Réaction $e^+e^- \rightarrow e^+e^-(\gamma)$* , Ph.D. thesis, University of Geneva, 1992.

- [140] A. Balandras, *Recherche de Supersymétrie dans les Canaux avec Un ou Deux Leptons avec le Détecteur L3 à LEP*, Ph.D. thesis, LAPP, 2000.
- [141] Y. Kubota *et al.*, Nucl. Instrum. Meth. **A 320**, 66 (1992).
- [142] T. Bohringer *et al.*, Phys. Rev. Lett. **44**, 1111 (1980);
G. Mageras *et al.*, Phys. Rev. Lett. **46**, 1115 (1981).
- [143] Y. Chan *et al.*, IEEE Trans. Nucl. Sci. **25**, 333 (1978);
M. Oreglia *et al.*, Phys. Rev. **D 25**, 2295 (1982);
R. Partridge, *A Study of the $\Psi''(3370)$ using the Crystal Ball Detector*, Ph.D. thesis, Caltech, 1984.
- [144] J. M. Bauer [BABAR Collab.], *Absolute Energy calibration with the Neutron-activated Liquid-source System at BaBar's CsI(Tl) Calorimeter*, arXiv:physics/0312128 (2003); M. Kocian [BABAR Collab.], *Performance and Calibration of the Crystal Calorimeter of the BABAR Detector*, SLAC-PUB-10170, in Proceedings of CALOR 2002, Pasadena, California, 167.
- [145] G. Gratta, H. Newman, and R.Y. Zhu, Ann. Rev. Nucl. Part. Sci. **44**, 453 (1994).
- [146] A. Aloisio *et al.*, *Calibration of the KLOE Electromagnetic Calorimeter*, in Proceedings of CALOR 2002, Pasadena, California, 388.
- [147] K. Miyabayashi, *Monitoring and Calibration of the BELLE Electromagnetic Calorimeter*, in Proceedings of CALOR 2002, Pasadena, California, 394.
- [148] J. A. Bakken *et al.*, Nucl. Instrum. Meth. **A 343**, 456 (1994).
- [149] R.Y. Zhu *et al.*, Nuclear Physics **B** (Proc. Suppl.) **44**, 109 (1995);
U. Chaturvedi *et al.*, IEEE Trans. Nucl. Sci. **47**, 2101 (2000);
A. Favara *et al.*, Nucl. Instrum. Meth. **A 461**, 376 (2001).
- [150] H. Ma *et al.*, Nucl. Instrum. Meth. **A 274**, 113 (1989).

- [151] W. Lu, *A Study of Bhabha Scattering at the Z Resonance*, Ph.D. thesis, Caltech, 1997.
- [152] R.A. Lee, *Radiative Decays of the A Study of the Ψ' to All-photon Final States*, Ph.D. thesis, Stanford University, 1985.
- [153] T.W. Bonner and J.E. Evans, Phys. Rev. **73/7**, 666 (1948).
- [154] R.Y. Zhu, *EGS Study on the BGO Calibration by Using Low Energy Photons*, L3 Internal Report, December 1985.
- [155] R.Y. Zhu, Nucl. Instrum. Meth. **A 306**, 145 (1991).
- [156] BHWIDE version 1.03 is used:
S. Jadach, W. Placzek, and B.F.L. Ward, Phys. Lett. **B 390**, 298 (1997).
- [157] GGG Monte Carlo Program:
F.A. Berends and R. Kleiss, Nuclear Physics **B 186**, 22 (1981).
- [158] L3 Collab., M. Acciarri *et al.*, Phys. Lett. **B 475**, 198 (2000);
L3 Collab., P. Achard *et al.*, Phys. Lett. **B 531**, 28 (2002).
- [159] M. Gataullin *et al.*, *L3 BGO Calorimeter Calibration using an RFQ Accelerator*, in Proceedings of CALOR 1999, Lisbon, Portugal, 417.
- [160] D. Duchesneau, private communication (2003).
- [161] P. Achard, *Production inclusive de hadrons dans les collision de deux photons au sein de l'expérience L3*, Ph.D. thesis, University of Geneva, 2003.
- [162] L3 Collab., O. Adriani *et al.*, Phys. Lett. **B 286**, 403 (1992).
- [163] M. Sanders, *Pion (Non-) Correlations in Hadronic Events at the Z Resonance*, Ph.D. thesis, University of Nijmegen, 2002.
- [164] D. Barney, *A Pedagogical Introduction to the CMS Electromagnetic Calorimeter*, CMS Conference Report 1998/004.

- [165] D. Bailleux *et al.*, *ECAL Monitoring Light Source at H₄*, CMS Internal Note 2003/045.
- [166] R. Paramatti, *Calibration of the CMS Electromagnetic Calorimeter*, CMS Conference Report 2003/002; D. Futyan, *In-Situ Calibration of the CMS Electromagnetic Calorimeter*, CMS Conference Report 2003/005.
- [167] Annual Report to the DOE, Caltech HEP Division, 2004.
- [168] TEEGG version 7.1 is used:
D. Karlen, Nucl. Phys. **B 289**, 23 (1987).
- [169] EXCALIBUR version 1.11 is used:
F.A. Berends, R. Pittau, and R. Kleiss, Comput. Phys. Comm. **85**, 437 (1995).
- [170] DIAG36 Monte Carlo:
F.A. Berends, P.H. Daverfeldt, and R. Kleiss, Nucl. Phys. **B 253**, 441 (1985).
- [171] L3 Collab., P. Achard *et al.*, CERN-PH-EP/2005-01, (2005).
- [172] D. Kirkby, *A Study of Final-State Radiation in Hadronic Z Decays*, Ph.D. thesis, Caltech, 1996.
- [173] G. Raven, *Measurement of Invisible Z Decays*, Ph.D. thesis, University of Utrecht, 1995.
- [174] National Institute of Standards and Technology, Physical Reference Data, <http://physics.nist.gov/PhysRefData/>.
- [175] J. Alcaraz, J. Casaus, and C. Palomares, *Measurement of the Photon Conversion Probability at Low Polar Angles at LEP2*, L3 Note 2106, March 1997.
- [176] L3+C Collab., P. Achard *et al.*, Phys. Lett. **B 598**, 15 (2004).
- [177] L3+C Collab., O. Adriani *et al.*, Nucl. Instrum. Meth. **A 488**, 209 (2002).
- [178] L3 Collab., M. Acciarri *et al.*, Phys. Lett. **B 470**, 268 (1999).

- [179] L3 Collab., M. Acciarri *et al.*, Phys. Lett. **B 431**, 199 (1998).
- [180] R. Barlow, *Systematic Errors: Facts and Fictions*, arXiv:hep-ex/0207026 (2002); The BaBar Statistics Working Group, *Recommended Statistical Procedures for BaBar*, BaBar Analysis Document 318 (2001).
- [181] OPAL Collab., K. Ackerstaff *et al.*, Eur. Phys. J. **C 8**, 23 (1999).
- [182] S. Blyth, private communication (2003).
- [183] L3 Collab., M. Acciarri *et al.*, Eur. Phys. J. **C 16**, 1 (2000).
- [184] See for example: G. Cowan, *Statistical data analysis*, Clarendon Press, 1998.
- [185] A. Shvorob, *A Study of W Boson Properties with Four-Jet W^+W^- events at LEP*, Ph.D. thesis, Caltech, 2000; S. Villa, *Measurement of the Triple Gauge Couplings of the W Boson at LEP2*, Ph.D. thesis, Northeastern Univ., 2000.
- [186] C. Parkes, *Practicalities of combining analyses: W physics results at LEP*, in *Advanced statistical techniques in particle physics*, Durham, pp. 211-214, 2002; L. Lyons, D. Gibaut, and P. Clifford, Nucl. Instrum. Meth. **A 270**, 110 (1988).
- [187] CDF and D ϕ Collaborations, Phys. Rev. **D 70**, 092008 (2004).
- [188] A. Favara and M. Pieri, *Confidence level estimation and analysis optimisation*, Preprint DFF-278/4/1997, arXiv:hep-ex/9706016 (1997).
- [189] L3 Collab., M. Acciarri *et al.*, Phys. Lett. **B 411**, 373 (1997);
L3 Collab., M. Acciarri *et al.*, Phys. Lett. **B 495**, 18 (2000).
- [190] LEP Collaborations, *Lower bound for the Standard Model Higgs boson mass from combining the results of the LEP experiments*, CERN-EP/98-046, (1998).
- [191] A. Read, *Modified Frequentist Analysis of Search Results (The CLs Method)* in “Workshop on Confidence Limits”, eds. F. James, L. Lyons and Y. Perrin, CERN 2000-05, p. 81.; T. Junk, Nucl. Instrum. Meth. **A 434**, 435 (1999).

- [192] R.D. Cousins and V.L. Highland, Nucl. Instrum. Meth. **A 320**, 331 (1992).
- [193] J.L. Lopez, D.V. Nanopoulos, and A. Zichichi, Phys. Rev. **D 55**, 5813 (1997).
- [194] S. Dimopoulos, S. Thomas, and J.D. Wells, Phys. Rev. **D 54**, 3283 (1996).
- [195] L3 Collab., A. Arefiev *et al.*, Nucl. Instrum. Meth. **A 285**, 403 (1989);
L3 Collab., O. Adriani *et al.*, Nucl. Instrum. Meth. **A 302**, 53 (1991).
- [196] A. Boucham, *Recherche de Neutralinos avec le Détecteur L3 au LEP*, Ph.D. thesis, LAPP, 1996.
- [197] “Interpretation of Neutralino and Scalar Lepton Searches in the Minimal GMSB Model”, M. Gataullin *et al.*, L3 Note 2777, October (2003).
- [198] ISAJET version 7.51 is used:
F.E. Paige *et al.*, arXiv:hep-ph/0312045 (2003).
- [199] L3 Collab., P. Achard *et al.*, Phys. Lett. **B 545**, 30 (2002).
- [200] L3 Collab., P. Achard *et al.*, Phys. Lett. **B 597**, 145 (2004).
- [201] W.J. Stirling and A. Werthenbach, Phys. Lett. **B 466**, 369 (1999).
- [202] L3 Collab., M. Acciarri *et al.*, Phys. Lett. **B 467**, 171 (1999);
L3 Collab., P. Achard *et al.*, Phys. Lett. **B 586**, 151 (2004).
- [203] A. Hill and J.J. van der Bij, Phys. Rev. **D 36**, 3463 (1987);
R. Casalbuoni *et al.*, Nucl. Phys. **B 282**, 235 (1987).
- [204] S. Godfrey, *Quartic Gauge Boson Couplings*, Proc. International Symposium on Vector Boson Self-Interactions, UCLA, February 1995.
- [205] G. Belanger and F. Boudjema, Phys. Lett. **B 288**, 201 (1992).
- [206] G. Bélanger *et al.*, Eur. Phys. J. **C 13**, 283 (2000).
- [207] G. Montagna *et al.*, Phys. Lett. **B 515**, 197 (2001).

- [208] L3 Collab., P. Achard *et al.*, Phys. Lett. **B 527**, 29 (2002).
- [209] L3 Collab., P. Achard *et al.*, Phys. Lett. **B 540**, 43 (2002).
- [210] W.J. Stirling and A. Werthenbach, Eur. Phys. J. **C 14**, 103 (2000).
- [211] *Triple Gauge Couplings*, G. Gounaris *et al.*, in *Physics at LEP 2*, Report CERN 96-01 (1996), eds. G. Altarelli, T. Sjöstrand, F. Zwirner, Vol. 1, p. 525.
- [212] A. Jacholkowska, J. Kalinowski, and Z. Wąs, Comp. Phys. Comm. **124**, 238 (2000).
- [213] A. Jacholkowska, J. Kalinowski, and Z. Wąs, Eur. Phys. J. **C 6**, 485 (1999).
- [214] L3 Collab., M. Acciarri *et al.*, Phys. Lett. **B 461**, 397 (1999);
L3 Collab., P. Achard *et al.*, Phys. Lett. **B 517**, 67 (2001).
- [215] OPAL Collab., G. Abbiendi *et al.*, Phys. Lett. **B 602**, 167 (2004);
OPAL Collab., G. Abbiendi *et al.*, Eur. Phys. J. **C 18**, 253 (2000).
- [216] DELPHI Collab., J. Abdallah *et al.*, Eur. Phys. J. **C 38**, 395 (2005).
- [217] OPAL Collab., R. Akers *et al.*, Z. Phys. **C 65**, 47 (1995).
- [218] CDF Collab., D. Acosta *et al.*, Phys. Rev. Lett. **89**, 281801 (2002).
- [219] CDF Collab., D. Acosta *et al.*, Phys. Rev. **D 71**, 031104 (2005).
- [220] DØ Collab., V.M. Abazov *et al.*, Phys. Rev. Lett. **94**, 041801 (2005).
- [221] OPAL Collab., G. Abbiendi *et al.*, Phys. Rev. **D 70**, 032005 (2004).
- [222] DØ Collab., V.M. Abazov *et al.*, Phys. Rev. Lett. **90**, 251802 (2003).
- [223] CDF Collab., D. Acosta *et al.*, Phys. Rev. Lett. **92**, 121802 (2004).
- [224] CMS Experiment, CERN/LHCC/94-38, <http://cmsdoc.cern.ch/cms.html>
- [225] ATLAS Experiment, CERN/LHCC/94-43, <http://atlas.web.cern.ch/Atlas/>

- [226] I. Fleck, Eur. Phys. J. **C 34**, S185 (2004);
K. Hoepfner, Eur. Phys. J. **C 34**, S161 (2004).
- [227] F.E. Paige, *SUSY signatures in ATLAS at LHC*, arXiv:hep-ph/0307342 (2003).
- [228] B. Zhou, Eur. Phys. J. **C 34**, S241 (2004);
L. Vacavant, Eur. Phys. J. **C 33**, S924 (2004).
- [229] O.J.P. Eboli *et al.*, Phys. Rev. **D 69**, 095005 (2004).
- [230] L3 Collab., P. Achard *et al.*, Phys. Lett. **B 587**, 16 (2004).
- [231] LEP SUSY Working Group: <http://lepsusy.web.cern.ch/lepsusy/>
Single Photons 130-208 GeV, Note LEPSUSYWG/04-10.1 (2004);
Acoplanar Photon Pairs 130-208 GeV, Note LEPSUSYWG/04-09.1 (2004).
- [232] LEP Exotica Working Group: <http://lepexotica.web.cern.ch/LEPEXOTICA/>
Combination of LEP Results on Direct Searches for Large Extra Dimensions,
Note LEPEXWG/2004-03 (2004).
- [233] F.A. Berends *et al.*, Nucl. Phys. **B 301**, 583 (1988).
- [234] M.E. Peskin, D.V. Schroeder, *An Introduction to Quantum Field Theory*,
Addison-Wesley, 1995, pp. 202-208.
- [235] O. Nicrosini and L. Trentadue, *Structure Function Techniques In e^+e^- Collisions*,
CERN-TH-5437/89, in Proceedings of the Workshop on Electroweak
Radiative Corrections for e^+e^- Collisions, Ringsberg, Germany, 1989.
- [236] E.A. Kuraev and V.S. Fadin, Sov. J. Nucl. Phys. **41**, 466 (1985);
G. Altarelli and G. Martinelli, *Physics at LEP*, CERN Report 86-02, J. Ellis
and R. Peccei, eds. (Geneva, 1986); O. Nicrosini and L. Trentadue, Phys. Lett.
B 196, 551 (1987) and Z. Phys. **C 39**, 479 (1988).
- [237] S. Ambrosanio *et al.*, Nucl. Phys. **B 478**, 46 (1996).

- [238] K.M. Hamilton, *Radiative Corrections, New Physics Fits and $e^+e^- \rightarrow ? \rightarrow f\bar{f}$* , hep-ph/0311322 (2003).
- [239] D.R. Yennie, S.C. Frautschi, and H. Suura, *Annals Phys.* **13**, 379 (1961).
- [240] S. Jadach and B.F.L. Ward, *Phys. Rev. D* **38**, 2897 (1988);
A. Schalicke, F. Krauss, R. Kuhn, and G. Soff, *JHEP* **0212**, 013 (2002).
- [241] Bear Project, <http://nis-www.lanl.gov/groups/nis-4/proj/bear.shtml>
- [242] Air Force 2025, Chapter 3b, <http://www.au.af.mil/au/2025/>
- [243] E. Speth, *Rep. Prog. Phys.* **52**, 57 (1989).
- [244] <http://www.accsys.com/>
- [245] K.N. Leung, *Rev. Sci. Instrum.* **59/3**, 453 (1988);
K.N. Leung, *Rev. Sci. Instrum.* **62/1**, 100 (1991).
- [246] K. Saadatmand, *Rev. Sci. Instrum.* **66/6**, 3438 (1995);
K. Saadatmand, *Rev. Sci. Instrum.* **67/3**, 1318 (1996).
- [247] M. Weiss, *Radio-Frequency Quadrupole*, in *Advanced Accelerator Physics Course*, Rhodes, Greece, 1993, **Vol. 2** 959.
- [248] J.M. Potter, *A Parallel Planar Triode Array High Power Rf System For Accelerator Applications*, in *Proceedings of EPAC 1990*, Nice, France, **Vol. 1** 991.
- [249] M. Hanada, *Rev. Sci. Instrum.* **75/5**, 1813 (2004).
- [250] H. Tawara and A. Russek, *Rev. Mod. Phys.* **45/2** 178 (1973).
- [251] D. Zahnow *et al.*, *Z. Phys. A* **351**, 229 (1995); K.N. Mukhin, *Experimental Nuclear Physics*, Mir Publishers, Moscow, 1987, **Vol. 1** pp. 559-562.
- [252] E.I. Sirotinin *et al.*, *Nucl. Instrum. Meth. B* **4**, 337 (1984).

- [253] I. Kominis and I. Nemenman, *BGO Dead Crystal Correction and Shower Fitting*, L3 note 2157, November 1997; F. Filthaut, *Shower Fitting in the L3 BGO Calorimeter*, L3 note 2240, March 1998.
- [254] L. Xia, *Search for Scalar Leptons at LEP with the L3 Detector*, Ph.D. thesis, Caltech, 2002.
- [255] P. A. Movilla Fernandez, Nucl. Phys. Proc. Suppl. **74**, 384 (1999).
- [256] S. Rosier, private communication (2004).
- [257] H. Hu and J. Nielsen, *Analytic Confidence Level Calculations Using the Likelihood Ratio and Fourier Transform*, in “Workshop on Confidence Limits”, eds. F. James, L. Lyons, and Y. Perrin, CERN 2000-05, p. 190.
- [258] DØ Collab., *Search for large extra spatial dimensions in Jets + Missing E_T topologies*, D0–CONF 4400 (2004).